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Is It Prosecution or Persecution?

Viewpoints differ, and for that reason alone the public is often compelled to "stand pat" when the government takes action in bringing criminal prosecution against alleged corporate violators of the law. An individual citizen can, however, make his own deductions after proper consideration of the apparent difference in viewpoints brought out in legal combat.

Of the recent bath tub trust case the Boston News Bureau says:

"Robert B. Honeyman, chief counsel for defence in criminal prosecution of so-called bath tub trust, says special agents for department of justice had been opening letters sent to the defendants and their counsel during the trial and that Postmaster Warren of Detroit had admitted when complaint was made to him that he knew that some one had been doing it.

"Mr. Honeyman proposes to get at the bottom of the letter opening business and will push an investigation which is now being made. Some letters containing important documents he never received at all, he said. Mr. Honeyman said he had no doubt government prosecutors had resorted to this method of trying to get evidence to bolster up a case which never had any basis and in which District Judge Angell, who tried the case, practically ordered a verdict of not guilty.

"'For some reason or other several of the jurors disagreed with Judge Angell's ruling that the licenses, which were the basis of the government prosecution, were valid and refused, after they had been out ten hours, to agree to a verdict,' said Mr. Honeyman. 'I don't think the case will ever be brought to trial again. If it is, somebody will be sorry.'

"Mr. Honeyman says that when the jury went out Edwin P. Grosvenor, special assistant to Attorney-General Wickersham, who conducted the prosecution; United States District Attorney Tuttle and former District Attorney Watson, who are all in the case, said that the jury wouldn't be out five minutes before they would return a verdict of acquittal.

"During all the time the case has been pending the government has been flooding the newspapers with statements that this great trust was putting $100,000,000 a year into its pockets and making the people pay $25,000,000 more than they should for their bath tubs, when, as a matter of fact, the total business by all companies a year does not exceed $14,000,000. Mr. Grosvenor himself has been writing articles for the Outlook and other magazines telling how severe the government intended to be. In January last when we were getting certain motions before Judge Angell out of the way and arranging for the trial Mr. Grosvenor used insulting language to the court and told the judge what his duties were. Judge Angell replied in pointed language that he was able to comprehend his duties without assistance from the department of justice.

"During the trial the government conducted its usual newspaper campaign and stated that the case was a cinch. A large force of special agents and detectives were sent there and they watched every move we made. We had nothing to conceal, but still it is a sample of the government methods."

Where Progressiveness is Noticeable

Business of the Plumber and Steamfitter and the Advancement of the Trade Is Seen to Exclude and Include Opportunities

By "The Spectator"

Not long ago the Spectator, after spending a handful of nickels for car-fare, came back to his desk brimful of inspiration, and straightway set about the congenial task of writing words of praise about the progressive spirit of the heating and plumbing contractors of Chicago. These encomiums found their way into print in a recent issue of "Domestic Engineering" and to the Spectator's

"The Spectator Was Deep in His Morning Paper."

intense gratification they apparently have been read by some subscribers, for he notices along his regular route home that in several places whose interiors have hitherto been as effectually screened from the public view as any cautious bar-keeper could wish, boilers and bath-tubs are now visible through newly washed show-windows, and the public no longer doubts that these places are plumbing and heating establishments.

But a fly has fallen into the ointment. The Spectator finds that he unwittingly over-estimated that spirit of progressiveness. The discovery of this fly was purely accidental and after the manner set forth as follows:

The street car had stopped midway between corners. The Spectator was deep in his morning paper, trying hard to get some head and tail to that "initiative and referendum" business. The stopping of a street car between streets has a peculiar psychological effect upon its passengers. The most casual reader of a newspaper or magazine will stick to the text serenely, mile after mile, so long as the car behaves itself and stops as it should, only at the street crossings, but let it once break its program and stop where it shouldn't—well, in such an event the Spectator would defy Thomas Carlyle himself to keep his mind concentrated on the report of a nothing-to-nothing base-ball game—and, the Spectator is no Thomas Carlyle. However, the explanation of the interruption was quite simple and apparent. One of those periodical blizzards that have been making the winter of 1911-12 conspicuous was settling down to its regular stunt of tying up Chicago traffic and making everybody uncomfortable. The Spectator had resigned himself to the indefinite postponement of his journey and was just turning the paper to the theatrical news when his eye, piercing the storm, caught one of those recently washed windows and a sign hanging over it proclaiming that the proprietor within served his fellow-men as a plumber and steamfitter. He immediately took another look—then he folded his paper and got off the car.

The proprietor was glad to see him; doubly glad when told that he was one of the staff of this weekly educator, and to prove it he was eager to answer all questions. The very first was:

"What in the world is the contrivance in the window?"

"A vacuum cleaner."

"A vacuum cleaner! Well, why a vacuum cleaner in a plumber's shop?"

"Why, to sell; to install along with heating and plumbing outfits, of course. What else?"

"But," said the Spectator, "how is this? Not so very long ago a man came to my house to sell and install a vacuum cleaner. He was not a plumber nor a steamfitter. He said he represented the manufacturer."

The proprietor smiled good-naturedly. "No doubt he did," said he. "And that is the sad part of it. Now let me tell you something and then you judge if it isn't a sad case."

Whereupon he told the Spectator that pipes had to be installed in a house if a vacuum cleaner was to be used

"What in the World Is the Contrivance in the Window?"

and this, he claimed, was work for a plumber or steamfitter. Also, he declared that so far as jurisdiction was concerned it made no earthly difference whether such work was done by the plumber or steamfitter. Each had an equal chance. Also that there is a good profit

in the sale of vacuum-cleaning machines and only a small profit for piping work. Further, that manufacturers, for jurisdictional reasons, could not make piping installations themselves, but must get a plumber or steamfitter to do this for them, and that there actually are plumbers and steamfitters who are content to take a small profit for piping and completely overlook the profit they might make if they also sold and installed a machine. Also

"Almost Tearfully He Said Something About the Possibility of This New and Remunerative Business Being Lost."

he called attention to the size of the city; the number of buildings already up that should have vacuum cleaning plants; the number that are going up and will have cleaning plants, and then almost tearfully he said something about the possibility of this new and remunerative business being lost altogether to his profession simply through the lack of enterprise—the unfortunate old conservatism that sees only bath-tubs and boilers, and blinds it to an opportunity so logically belonging to it by almost sovereign right. Had he wept outright the Spectator would have joined in sympathy, for there was the fly in his ointment. Only to think of all those nice things he wrote about progressiveness.

"LOOKING THROUGH A KNOT HOLE AT A KNOTTY PROBLEM."

Paper by John W. Sands, President of Brooklyn Master Plumbers' Association, Read at the Twenty-fourth Annual Convention of the New York State Master Plumbers' Association, Held at Troy, N. Y., March 11, 12 and 13, 1912.

Appreciating, as we all do, the advantages of membership in the Master Plumbers' Association and knowing the many benefits derived, we are often amazed at the attitude of the plumber on the outside, who having all these advantages presented to him clearly and logically by our members, through the medium of trade papers and in the literature distributed at various times by local associations, still refuses to "enter the fold" and "try it on" at least. Seeing and hearing is not believing with him. It has been my experience, that while many may promise to assume, by membership, their proportionate share in the maintenance of trade protection, time is no limit in the keeping of their promise, which at best, is but a flash in the pan, and we begin to realize that an "overripe" promise is hard to keep and soon decays. Others again, through unfortunate circumstances in their business or otherwise, cannot live up to their agreements made. We can feel for the latter, for a "fall down" is forgivable, but a "lay down" deserves the gate when the final test comes.

This attitude of those outside of our Association can, in my opinion, be best illustrated in the following manner: The small boy during the base ball season, when, while he may be filled to the brim with enthusiasm and pride in the home team, through the want of the price or other qualifications necessary to admission, cannot enter the grounds and be with the elect, is compelled to view the happenings in the inside from the dreary outside. His first impulse is to find a convenient "knot hole" to which to glue his eye. If he is diffident and does not get close to the "knot hole," while he hears the glad shouts of the spectators, he sees nothing. The closer he approaches the "knot hole" the more he sees. And finally unable to resist the magnetic influence of the game, in defiance of everything he either climbs the fence or begs or borrows his way in, so as to "get into the game."

This suggested to me my title: "Looking through a knot hole at a knotty problem."

Assuming, to apply the illustration above, that the fence is the barrier that separates the member from the non-member, and we might say that this is the Initiation Fee and Dues. The home team are the officers and committees working and striving to better conditions of the trade. The "small boy" is the non-member. The "knot hole" is the "Open Meeting" affording him the opportunity to view, from the outside, the happenings on the inside. If his inclination is to stay away and not get close enough to look through, he sees and hears nothing. But if he, like the "small boy," glues his eye to the "knot hole" (that is, attends the "Open Meeting) he, in most cases, becomes enthused, climbs the fence (signs an application) and assumes to pay his share in the uplifting and upbuilding of the trade. In many cases we find him trying to "make the team" and become one of the active workers. That is, if he has real red blood in his veins.

Locally, in Brooklyn, we find that through this "looking through the knot hole" or, the holding of "Open Meeting" has created a better feeling, in the trade, towards the Association and, we find, that we are getting in closer touch with the "man outside" than we have ever been able to heretofore. It is my suggestion to all local associations throughout the state and in all the states that they should annually celebrate the Anniversary of the National Association, and that it be in the form of an "Open Meeting," affording all in the trade an opportunity to look through the knot hole.

CITIZENS OF MINNEAPOLIS, MINN., ASK APPROPRIATION FOR COMFORT-STATION.

Charles M. Loring, Chairman of the Public-Comfort Station Committee of the Publicity Club of Minneapolis, Minn., has reported to the club that after careful investigation his committee feels sure that a public-comfort station is a physical, moral and economic necessity which the welfare of the city demands at once. The Publicity Club has therefore recommended to the city council the erection of a station, the design and location to be determined by the council, as soon as a fund of $25,000 can be secured for this purpose. The recommendation is in the hands of the council committee on appropriations.

Only Two Views.

"I wonder why a woman repeats everything you tell her?"

"My dear boy, a woman has but two views of a secret. Either it's not worth keeping, or it's too good to be kept."—Judge.

Evidences of Superiority of the Thermostatic Radiator Trap by Comparative Analysis

By J. W. Hook, Marshalltown, Ia.

It would be difficult for any one reading the article entitled "Some Points Involving Mechanism and Advantages of Vacuum Steam Heating," appearing in the December 2nd issue of "Domestic Engineering" to gather the impression that its author favors the thermostatic class of radiator return valve in preference to the float class in systems of vacuum steam heating. If any one has gotten such an impression, it is not altogether a wrong one, although a qualification of the thermostatic valve favored and the reasons for favoring it is necessary to avoid misunderstanding.

Radiator traps may consistently be divided into two classes: first, float; second, thermostatic.

The class of thermostatic traps may be further divided into two distinct types as follows: First, the carbon-post thermostatic. Second, the hollow-disc thermostatic.

The above division, while possibly not entirely complete, leaves but three traps to be considered, as follows:

First. The trap built upon the float method.

Second. The thermostatic trap built with solid carbon post.

Third. The thermostatic trap built with hollow disc which contains a mixture of volatile liquids.

Let us consider for a moment the "pros" and "cons" of these three traps, not particularly for the purpose of discarding one and adopting the other, but for the instruction that we might get out of the analysis.

In this consideration we will stay as closely as possible to the rules of logic, starting out with a hypothesis that will define what a perfect trap should do and compare the traps in question with that hypothesis. In this manner we cannot consistently disgress from facts, and we can feel pretty sure when we have finished that the impression the reader will get cannot be very far from correct.

In choosing our hypothesis let us look first of all at the "major functions." What is a radiator trap for in a heating system?

First. It is to let the air out of the radiator into the return-line.

Second. It is to let the water out of the radiator into the return-line.

Third. It is to prohibit steam from passing out of the radiator into the return-line.

In one sentence, the radiator trap is made for the purpose of permitting the free discharge of water and air from the radiator without the loss of steam.

But, in performing these "major functions," the radiator trap is obliged to adjust itself to other conditions, it must do other things. These other things, which we will call "minor functions," are as follows:

First. It must operate upon a range of steam pressure from twenty inches below atmosphere to fifteen lbs. above.

Second. It must not clog up and thereby become inoperative.

Third. It must not wear out.

It doesn't seem that any one can deny that the above is a correct analysis of what a perfect working trap should do, and the adoption of same as a hypothesis by which to compare the three traps above mentioned in the mind of the writer is above criticism. We will therefore proceed with the "pros" and "cons", taking up firstly the "trap built upon the float method."

The float-trap gets its motive force from the flotation or buoyancy of a hollow metal float in less than a teacup full of water. However, this is true only when the float-chamber which contains the float is sealed with water. Granting that it is sealed with water most of the time, the motive force can be calculated by the float and the float itself. The displacement of the float in any float-trap is seldom, if ever, more than two cu. in., and when we remember that a cubic inch of water only weighs about .04 of a pound, we observe that the motive force produced is tremendously small. The larger the float, of course, the greater the motive force, but seldom if ever, is it more than a quarter of a pound.

With such a light force to be depended upon for operation, a drop of grease, a speck or so of core-sand wedging somewhere about the mechanism and sliding contacts, positively renders the trap inoperative, in which condition it remains until the engineer of the building or somebody else takes the time to clean it out. The process of cleaning is, in the aggregate, expensive and at least annoying, to say nothing of the mess that usually is created on the floor by water splattering around when the trap is opened.

Aside from the lack of motive force comes another weakness, which renders it reasonable to consider that a float-trap is virtually nothing more than a restricted opening leading from the radiator to the return-line. This weaknes is the fact that any provision in the float-trap to allow for the discharge of air, also allows for the continuous waste of steam into the return-line. Air and steam at the same pressure are no different when asked to pass upward through a small column of water, except perhaps that the steam being lighter in weight has the greater tendency to do the "stunt." And that is what air and not steam is expected to do in a float-trap. Well, air, "that bug-a-boo of the heating engineer," must be gotten rid of and provision absolutely must be made in every radiator-trap for it to pass out. The writer has tested, several times, different makes of float-traps and has found that the steam loss per hour into the return-line where the pressure on the radiator was approximately one pound and the vacuum in the return-line approximately ten inches, amounted to from seven to ten pounds. Figure for yourself what the actual steam waste of a system of heating containing one-hundred return valves, each wasting seven pounds of steam per hour, would be. Especially think of the waste in a system where exhaust is not available and where extra feed-water is not necessary. Since steam necessarily, by decree of Mother Nature, will flow where air does when in contact with it and when the temperature of the two is not brought into play, then what, pray tell, is the reason for all this complicated mechanism of floats, water-seals, and the like, when a restricted opening between radiator and return is all that is produced anyway? Why not use a common one-half-inch elbow with the opening through it restricted by means of a plug with a hole in it? It certainly would be just as good, not half as complicated, and not cost a tenth as much!

We have noted that tests have shown a loss of seven pounds of steam per hour through some makes of float-traps. Some might say that most of this loss can be accounted for

by the fact that the water of condensation revaporizes when discharged into the low pressure in the return-line. While it is true that water at a temperature higher than the boiling point of water under the pressure existing in the return-line when discharged into the latter will partially revaporize, yet the amount of such revaporization is so very small as to be almost negligible. We will prove this statement.

Steam is nothing more than water charged with heat. The heat necessary to change water into steam after the temperature of the former is brought up to the boiling point is called "latent heat." Under atmospheric pressure of 14.7 lb. per sq. in. absolute, water will boil at approximately 212 degrees F. As the absolute pressure is increased or reduced, the temperature of the boiling point of the liquid is also increased or reduced. The latent heat of a pound of steam at 212 degrees F., which is the boiling point of water at atmospheric pressure, is 965.7 B. t. u. But it took some heat to bring the temperature of the pound of water up to the boiling point. This amount is one B. t. u. for each degree rise in temperature and is called the "sensible heat" of the liquid. Then above 32 degrees F. a pound of steam under atmospheric pressure contains 965.7 B. t. u. of latent heat and 180 B. t. u. of sensible heat.

It is safe to say that practically the only available heat from steam for heating purposes is the latent heat, because as soon as the steam is condensed back to water the latter should be discharged from the radiator at once.

Therefore, we can see that if steam under atmospheric pressure condenses in a radiator, the water of condensation must be discharged into the return-line.

Now we will suppose that a vacuum of 9.56 in. exists in the return-line. Water under that degree of vacuum boils at approximately 193.2 degrees F. We will assume that the steam in the radiator is circulating at atmospheric pressure. Water boils under atmospheric pressure at approximately 212 degrees F. As the steam condenses in the radiator the temperature of the water of condensation is approximately 210 degrees F. Now if a pound of this water is discharged into a vacuum of 9.56 inches, it will contain in the lower temperature 16.8 B. t. u. of latent heat per pound. (The difference between the actual temperature of the liquid and the boiling point of the liquid under the lower pressure.) This 16.8 B. t. u. tends to cause revaporization.

Since the latent heat of steam at a vacuum of 9.56 in. is 979 B. t. u., then it means that under the above conditions 16.8/979 of every pound of condensation discharged through the trap revaporizes. In a heating job containing nine thousand sq. ft. of radiation, basing the average condensation per sq. ft. of radiating surface at one-half pound per hour, we would see that in an hour's time 16.8/979 of 9000/2 = 77 pounds of water would evaporize, or a little over one pound per minute. Such a small amount of vapor coming as it does in contact with as many different points in the return-line as there are radiators in the job, would condense almost instantly.

From the above it is very evident that where seven pounds of steam is passed by the trap that there must be a tremendous waste. Seven pounds of steam at atmospheric pressure represents approximately 7x965.7 = 6759.9 B. t. u. of heat wasted. Assuming that the coal burned contains 12,900 B. t. u. of heat per pound and that forty per cent of this heat is lost in making draft and radiation at the boiler, we have 7,200 B. t. u. of heat per pound that is transferred to the steam. In other words, where a trap passes seven pounds of steam per hour, there is practically one pound of coal wasted per hour for every float-trap installed. Especially is this loss prevalent where the jet-water used to condense the steam must be wasted. But even where it can be used in the boiler, the action of the steam in the return-line is to reduce the differential of pressure that should exist in a vacuum system of heating immediately between radiator and return. The writer has observed some installations where a pressure would be observed on the return-line near the farthest radiator, while a vacuum would appear at the jet-condenser near the vacuum-pump.

Under such conditions the vacuum principle as applied to steam heating is almost destroyed.

So much for the description of the float-trap. Let us see what we have:

First: We have seen that this type of trap has very little motive force, hindering it from (a) closing tight for steam; (b) causing it to easily clog up when grease and dirt come in contact with it.

Second: That any provision made in it to allow for the discharge of air will also allow for a constant leakage of steam, necessitating an expensive jet-condenser to destroy the steam allowed to get into the return line.

In the mind of the writer, the float-trap fails to perform the one most important "major function" as well as one of the most important "minor functions" above enumerated as requisites of the radiator trap.

It won't take much time to point out the very evident fallacy of the carbon-post thermostatic trap. This trap is constructed with a solid carbon-post as its expanding member. When the heat of steam strikes this post it expands and seats the valve attached to it upon the valve-seat below. Water of condensation or air following at a lower degree of temperature and coming in contact with the post cause it to contract and lift the valve off the seat, thereby opening communication between the radiator and return-line so that the water and air are permitted to drain out of the radiator.

Now, let us analyze this proposition for a moment. Nature very conveniently has decreed that any solid bar of metal when brought in contact with changeable temperatures will expand and contract lengthwise only. She also provides that such expansion shall be in absolute proportion to the temperature. With these two unalterable laws of nature in mind let's apply our thought to a thermopost radiator trap in actual service.

The trap, we will assume, is set so that steam coming along at one pound pressure above atmosphere, or about 215 degrees F., will cause the post to expand down and close the opening leading into the return-line. Water of condensation at the same pressure of one pound accrues in the bottom of the radiator and coming along to the post at a temperature of, say, 213 degrees F., contracts it, thereby opening a way to get into the return-line. Steam following expands the post again and the trap closes.

But the fireman in the boiler-room about this time allows the pressure on the heating system to run up to three pounds. Steam coming in contact with the post now has a temperature of about 222 degrees F., whereas before at one pound pressure its temperature was only 215 degrees F. What does the poor old post do? It does just what Nature decreed in the first place that it should do, simply expands further, pushing the valve down to its seat with a tremendous force, and perchance, if no provision for give is allowed, breaks something. But suppose provision for give is made and the valve closes and water of condensation comes along at 220 degrees F. Does the post contract to let it out? No, it cannot possibly contract enough for that until that water of condensation falls in temperature to several degrees below 215 degrees F., the original closing point. Imagine for yourself how long it would take water condensed from steam at 222 degrees

F. to fall nine degrees in temperature when it is remembered that it is in contact with the 222 degree steam all the time. Isn't such a trap absurb? While it might work fairly well on one steam-pressure, it will not operate successfully on any other. If the trap is set for one steam-pressure, it will not allow water of condensation to pass if a higher temperature is present. On the other hand, if a lower steam temperature is present it will not shut off the trap and a large steam waste is permitted.

This type of trap violates the first "minor function." A violation of this function means that except under one condition it will violate all three of the "major functions."

We arrive now at a consideration of the second type of thermostatic trap, viz., one whose operating mechanism is a hollow expandable receptacle containing a mixture of volatile fluids which vaporize and condense in accordance with changes of temperatures.

Before going into this further, let us consider a few of the unalterable laws of Mother Nature. First of all, she has decreed that the water of condensation and air in the radiator shall always be from one-half degree to two degrees colder than the steam it came from or may be in contact with. Second, she has decreed that as heat is added to any gas confined to one volume that the pressure will increase in direct proportion. This latter means that each steam temperature has a corresponding steam pressure.

Thermostatic radiator traps of the class we are now describing when made properly will have within their hollow operating mechanism a mixture of these aforesaid volatile fluids of such proportions that partial evaporization will take place when steam at a temperature of 162 degrees and a corresponding pressure of five pounds absolute, or 19.74 in. vacuum, comes in contact with it.

Let us suppose that the trap is in service on the radiator and steam at 162 degrees F., surrounds the receptacle containing the volatile fluids. Steam at a temperature of 162 degrees exerts a pressure of approximately five pounds absolute. Therefore, the temperature of 162 degrees should be great enough (and it will if the fluids are chosen and compounded properly) to vaporize a sufficient quantity of the fluid within the hollow receptacle to create an internal pressure great enough to overcome the five pounds absolute pressure on the outside, and thereby cause the receptacle containing the fluid to bulge and close the opening in the trap. As water of condensation from the steam or air comes along and surrounds the hollow receptacle, there is present around the latter a lower temperature but the same pressure, and enough of the vapor within previously formed by the steam is condensed to allow the pressure outside to overcome that inside, the receptacle collapses and the trap opens.

We could go along and take each successive steam temperature clear up to ten or fifteen pounds above atmosphere and we would find that if the fluids used within the hollow receptacle are of the proper compound and mixture that the same effect will take place, viz., the trap will close when stream strikes it and open at a slightly lower temperature as long as a lower temperature comes without a corresponding decrease in pressure.

It is simple where conditions permit a lower temperature without a corresponding decrease in pressure to be produced in certain parts of a radiator. When the steam condenses the water drops to the lowest point in the radiators. Air in loop or coil radiators being heavier than steam also gravitates to the lowest point. The water of condensation and air are always found to be slightly colder than the steam in contact with them, but the pressure is the same.

Therefore, in the hollow receptacle type or thermostatic trap (of course the hollow receptacle containing the volatile fluids must be on the inlet-side of the valve-opening and subject all the time to the conditions in the radiator), the differential in temperature between steam at all temperatures and its corresponding water of condensation and air can be transferred into motive force. At the same time an operating mechanism can be produced that will operate on varying steam-pressures.

The writer has tested some makes of thermostatic traps of this type in order to determine just what motive force could be produced with a differential in temperature of one degree and found that it run somewhere around eleven pounds at the valve. Some traps would show more, some less, but this came, no doubt, from the fact that the amount of liquid was changed in each trap. The motive force also decreased some with the temperature but even at a point considerably below atmosphere the motive force was four pounds at the valve.

Another great advantage of a trap built on the hollow receptacle thermostatic principle, is the simplicity. No sliding contacts, hinges, small orifices, etc., are necessary. On the contrary the valve-opening can be large, and best of all the air is given the same route out of the radiator that the water has. No water-seals are necessary and the two elements which must be eliminated from the radiator in order that it can heat to full efficiency, namely, water and air, have the same effect on the trap.

Let us summarize for a moment.

The hollow receptacle thermostatic trap has great motive force helping it to close tight for steam and to open wide for water and air. Its simplicity and large valve-opening coupled with the motive force almost insures it against clogging up. Its method of operation insures that it will work upon a large range of steam-pressures. It comes nearer fulfilling the requirements of the perfect trap in the writer's mind than any trap on the market.

We have not dwelt upon the third minor function with any of the three traps considered, viz., that the trap must not wear out. This depends largely upon the material used in construction, the delicateness of its mechanism, and the number of times it must be disassembled for cleaning. All of the traps considered have been on the market seven or eight years, and the matter of endurance can be gotten at pretty well by observing actual installations.

Coming down to the opinion, the writer is not backward in pointedly declaring that he favors the hollow-disc thermostatic-trap. However, he wishes it understood that he is not in the dire predicament that some get into once in a while, of being beyond the power of conviction. If any one can show him a trap, whether built upon the thermostatic principle or not, that presents more good features than the trap just described, his present position in the heating and ventilating field will not keep him from joining hands with its promoter.

We must all look at the advancement of the art, not merely at the profit in the sale of the traps, and be ready to boost along that proposition that comes the nearest to "delivering the goods" and that contributes the most to that important element in the comfort of any building—good heating.

Knew His Timepiece.

"Hello, Rummel! I hear you had your watch stolen the other day?"

"Yes, but the thief is already caught. Just think, the fool took it to the pawn shop and there they immediately recognized it as mine and detained him."—Fliegande Blaetter

News of the Wholesalers and Their Products

Presentation of Loving Cups to George T. Coppins and George H. Graves of the Walworth Mfg. Co.—Spring Meeting of National Association of Brass Manufacturers—Other News of Personal and Business Interest in the Trade

NOTABLE OCCASION IN THE HISTORY OF THE WALWORTH MFG. CO.

On Saturday afternoon, March 16th, there was presented to Mr. George H. Graves, treasurer, and Mr. George T. Coppins, secretary, of the Walworth Mfg. Company, of Boston, twin loving cups.

There were twenty subscribers to the fund which purchased these cups; the subscribers being, with two exceptions, men who had served immediately under the direction of Messrs. Graves and Coppins for a period exceeding twenty years. The names of the subscribers to the fund are given below with their terms of service set before each name. It is doubtful if this record can be equalled or even approached. The incident is all the more remarkable in that these men are still in active service and doing good work.

Years	Subscribers.
22	William P. F. Ayer, Assistant Secretary.
23	Hobart W. Brown.
64	Edward C. Clay.
21	James A. Cully.
50	Frank E. Evans.
43	Levi R. Greene.
41	Allen M. Green.
29	Wm. A. Jackson, Purchasing Agent.
23	Cornelius Keefe.
27	Eugene P. Keene.
18	Wm. P. Kerr.
11	Theodore W. Little.
34	Wm. W. Lunt.
29	Richard Morgan.
21	Joseph G. Reaser.
57½	Edward H. Rice.
57	George L. Rice.
22	George A. Ricker, Assistant Treasurer.
20	Herbert L. Rideout.
24	Harry A. West.

The cups were inscribed as follows:

"The leafy blossoming present time springs from the whole past."

and also

"If we mayn't tell you what we feel, what is the use of friends?"

The presentation speech was made by Mr. W. A. Jackson, purchasing agent of the company, as follows:

Mr. Geo. H. Graves, Treasurer, Mr. Geo. T. Coppins, Secretary.

The love and sentiment that go with these cups are but poorly conveyed by either the cups or their inscriptions. We ask you to remember that the subscribers count the years as twenty or more that they have served with you. An attorney appointed to defend a man charged with, and evidently guilty of robbery, and due for a sentence of twenty years under the Habitual Criminal Act is found guilty, was upbraided by his client because he put up practically no defence for him, simply leaning over the rail of the jury box, and saying, "Gentlemen, think of twenty years. Children grow to manhood, young men gain middle age, middle age becomes old age,—in twenty years. It is a long time out of a man's life. So, I beg of you to be sure he is guilty." The jury were sure,—that twenty years outweighed all the evidence,—and the prisoner went free.

All of us today think of twenty years—not a few of us, but think of more than twice twenty years. Can we, then, be blamed if over us comes

"A feeling of sadness and longing
That is not akin to pain,
And resembles sorrow only
As the mist resembles rain."

Especially when we recall that but for the hand of God there would be here present—Ben Polsey, Herman Eustis, Bob Morrison, George Pickering, and John Browning.

Loving Cups Presented to Geo. H. Graves and George T. Coppins, Treasurer and Secretary, respectively, of the Walworth Mfg. Co., Boston.

Things happen in twenty years. That this company here assembled with an active service record together which, doubtless, can hardly be equalled, is in itself remarkable, and will make the occasion memorable.

On this seventieth anniversary of the founding of our Grand Old Company, it seems fitting that we who have so long been associated together should show in this way our affection and respect to the two men who to us so intimately represent, by their present example, the traditions of the Walworth Manufacturing Company.

It is sometimes hard to live up to a reputation, but, Sirs, if either of you have found it a difficult task you have never let us know it.

In all these years the greatest, or the least amongst us, has been free to counsel with you at any time.

Your office door, Mr. Graves, has never been locked. Your desk, Mr. Coppins, has ever been easily accesible. You have both made us always to feel that our troubles were yours. You have never, either of you, found it necessary to keep any of us at a distance.

If sometimes, Mr. Treasurer, the weather has been slightly cloudy in your corner, the chances were that the

sun was shining brightly in your corner, Mr. Secretary—and we knew that both corners would be clear with the first of the wind.

There have been trials for you both: financial panics, sharp competition, slack trade, and many other troubles, but through it all Mr. Treasurer, and Mr. Secretary, you have both endured bravely, and inspired us to wait and hope for better things.

We are proud of our Treasurer, and our Secretary. They are the "real thing." "Be sure you get the Genuine. Look for the trade mark." "Geo. H. G."—"Geo. T. C."

For the future, as the years come and go, our ranks will be thinned, but as we drop out, others will take our places and maintain with credit the reputation of the Old Guard,—let us trust, better and with fewer mistakes than we have.

When the man whose likeness looks down upon us, and whose memory is still fresh and dear to many of us, gathered about him the men whom we honor today, "he builded better than he knew." So, Sirs, you may feel that the future is safe: That the good you have done will live after you.

Sirs, if you knew how spontaneous, enthusiastic, and generous was the response to the subscription list for these cups, you would be extremely gratified.

If we had not been selfish and barred all but the twenty-year, and, longer crowd, we could have easily had money enough to buy two cups as big as barrels.

Sirs, the "boys" have done this thing. A stranger, at first sight might be misled by the few grey hairs in some of our heads, and not think that we were all "boys," but, Sirs, you know better.

"For Age is Opportunity no less
Than Youth itself, though in another dress,
And as the evening twilight fades away
The sky is filled with stars invisible by day."

"The leafy blossoming present time, springs from the whole past—"

—Carlyle.

"If we mayn't tell you what we feel, what is the use of friends?"

—Thackeray.

SPRING MEETING OF THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS.

The National Association of Brass Manufacturers held one of its most successful spring meetings in the East Room of the Hotel La Salle, in Chicago, on Wednesday, March 21st, during which reports on legislative matters were received and acted upon; new members were elected and the reports received during the meeting indicated a rather better outlook for spring trade than was anticipated earlier in the year.

All reported the volume of business good, and the goods that must necessarily move in the next sixty days with the present upward tendency of copper, spelter and other materials, will materially better conditions, increase the demand, so that the spring will round out with a satisfactory business.

The meeting adjourned to convene in Detroit, Mich., on Tuesday and Wednesday, June 11 and 12, 1912.

WILL MANUFACTURE PLUMBING SPECIALTIES.

The John Wieben Co., of New York City, has been incorporated with a capital of $100,000 to manufacture plumbing specialties. The incorporators are: John Wieben, 2306 Third Ave.; Herman Wieben, 2306 Third Ave.; Peter Holland, 43 East 128th St., all of New York City.

PERSONAL MENTION.

M. C. Honeywell, president of the Honeywell Heating Specialty Co., Wabash, Ind., is at present sojourning in southern climes, where old Sol has no competition in the heat-generating business.

* * *

John Wolff, vice-president of the L. Wolff Mfg. Co., John Kelly, of Thos. Kelly & Bros. and John Heeney, of the E. Baggot Co., all of Chicago, are at the present time enjoying the balmy air of Hot Springs, Ark. Mr. Kelly is on a more extensive pleasure trip than Messrs. Wolff and Heeney, it being his intention to visit the Pacific Coast before he returns to Chicago.

* * *

Irving G. Dimond, who has been identified with the plumbing supply trade in Ohio for a number of years, has been elected secretary and treasurer of the National Sanitary Mfg. Co., of Salem, O., and also a member of the board of directors of this concern.

FORD & KENDIG OPEN DOWNTOWN BRANCH.

Ford & Kendig, jobbers of plumbing and heating supplies at 24th and Wood Streets, Philadelphia, Pa., are opening a down-town branch at 27 North Seventh Street in that city, where they will have an up-to-date display room devoted to their plumbing lines and heating specialties.

WILL DEAL IN PLUMBING SPECIALTIES.

The Mahoney Fountain Co., of Portland, Me., has been incorporated to deal in plumbing specialties. The incorporators are: Joseph F. Connolly, John T. Fagon, John J. Cunningham, Patrick A. Mahoney and Michael H. Myers.

REBUILDING ITS FOUNDRY WITHOUT DELAY.

The Canton Brass & Machine Co., of Canton, Ohio, is rebuilding its foundry which was damaged by fire a few weeks ago, to the extent of about $5,000. The company was fortunate enough to have its patterns well protected in its fireproof vault, which proved to be really fireproof. While the new factory building has been in process of construction, the company has been able to take care of its rush business through the courtesy of the Canton Hughes Pump Co., which kindly allowed the Canton Brass & Machine Co. to use one of its foundries. D. B. Whittingham, Manager of the latter company, expects to have the new modernly equipped foundry in operation by the 15th, from which date his company will be able to fill all orders promptly.

DEMAND FOR PLUMBERS' SUPPLIES IN BAVARIA.

Nuremberg and the adjacent city of Fuerth, with a combined population of more than 400,000, constitute one of the largest manufacturing centers in Europe. The hundreds of industrial plants, as well as the ordinary needs of prosperous and growing modern cities, make a large and constant demand for plumbers' and steam fitters' supplies, writes U. S. Consul George Nicholas Ifft, Nuremberg Germany. The greater part of such goods sold here are, of course, of German make, but fixtures and appliances of this kind of both American and English make are in use. There is always a demand for a superior article that can be sold at a reasonable price.

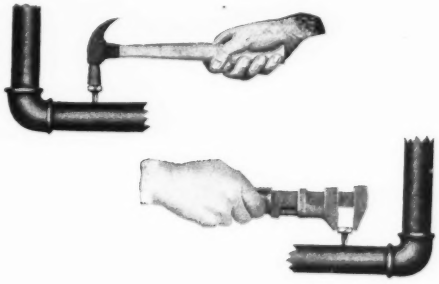
There are practically no direct importations by the local dealers. They buy most of the foreign-made goods of this class from a firm in Hamburg and one in Bremen, which are the leading importers in these lines in Germany. These firms carry large stocks in their warehouses and practically control the trade. Both issue elaborate illustrated catalogues and descriptive price lists of American and other foreign appliances of this character which they sell, and also send their traveling salesmen throughout Germany and southern Europe.

One of the leading local dealers says that he has found it much more practical to order from these firms than to buy direct, and that such has been the experience of the trade generally. The dealers of Nuremberg depend, practically, upon the local market. Their orders are usually for small quantities at a time, and thus the small difference in price is offset by the difference in cost of freight and the promptness in receiving the goods. The same dealer said that an order was sometimes given direct and the goods shipped by water as far as Mannheim or Wurzburg, but that this always meant a much larger order and a delay of several months, which the saving of 5 to 7 per cent in cost hardly justified.

The leading local dealers in steam fitters' and plumbers' supplies are all interested in American goods of this class and any of them would, under proper conditions as to quality of goods, prices, terms, etc., consider direct importation. While all of them have one or more clerks who can read or write an English letter, it would be preferable if correspondence with them and catalogues and price lists sent them were in the German language.

THE RAPID TAP PLUG.

The Rapid Tap Plug Co., of Grand Rapids, Mich., has just issued a neat folder illustrating and describing the Rapid



How to Insert the Rapid Tap Plug.

tap plug for repairing leaks in boilers, tanks, soil pipes, wrought iron pipes and fittings, making an instant and permanent repair. The accompanying illustrations give a clear

The Rapid Tap Plug and How It Can Be Used on a Water Heater.

idea of how easily this tap can be applied. The point of the plug can be started with a hammer and it can then be screwed down with any kind of a wrench. In repairing cast iron pipe or fittings it is however more satisfactory to drill a hole large enough to catch the threads of the plug on account of the danger of splitting. This tap plug is made of tempered tool steel, with threads perfectly machined. The milled slot gives a sharp cutting edge, making possible the combination of drill, tap and plug. All in all, it is a valuable time-saver for plumbers and steamfitters. Interested parties can obtain the above-mentioned folder upon application to the manufacturer. When writing kindly mention that "Domestic Engineering" gave you the tip.

THE ELJER EXHIBIT AT THE CONVENTION IN TROY, N. Y.

The Occidental Co., of New York City, Cleveland, O., and Pittsburgh, Pa., had a very elaborate exhibit of Eljer products at the recent convention of the New York Mas-

The Eljer Exhibit at the Troy Convention.

ter Plumbers' Association, held in Troy, N. Y. The accompanying illustration shows the excellent arrangement of the exhibit to advantage. The exhibit attracted much attention and H. B. Kimmey, of Albany, who was in charge, received many compliments on his enterprise in this connection.

TRADE LITERATURE RECEIVED THIS WEEK.

A. Wyckoff & Son Co., of Elmira, N. Y., is sending the trade a novel "Easter Greeting" in the form of a neatly gotten up folder with attractive illustrations of Wyckoff's improved cypress steam-pipe covering and giving nine reasons for its lasting qualities. Incidentally the folder also brings an up-to-date illustration of a flying machine, the reason for its appearance being stated as follows: "Eggs come high this year, consequently our friend, the Easter Chick, arrives in an aeroplane."

The Trenton Potteries Co., of Trenton, N. J., has just issued a private mailing card calling the trade's attention to the noiseless feature of the Si-wel-clo siphon jet closet and to the large advertising campaign the company has inaugurated to familiarize consumers with its value.

Climax Sanitary Co., Detroit, Mich., has just issued its catalog F., containing illustrations and complete descriptions of its products: "Maxco" low-down closet combination, low-down tanks, high tanks, closet seats and seat-operating closets. The book contains 48 pages, 6x9 inches, it is printed on high grade paper, and nothing but the best half-tone work obtainable has been used in its production, making it a very attractive and handsome catalog. Those who can make use of it in their business can obtain a copy of it upon application. Kindly mention "Domestic Engineering" when writing for it.

Methods of Practical Interest in the Heating Trades

Heating Mains and How They Are Installed—Heating Water for Domestic Use Where a Large Amount of Hot Water is Needed

THE HEATING MAIN.—II.

In the days when the Zoological gardens were less frequent and the sons of "Sunny Italy" were more pleasing by their absence than now obtains, some of them used to meander up and down the land with dancing bears. Ever see a bear dance? Well you know how the beast lumbers around and about how graceful it looks. I went into a building one time and there was the steam fitter doing the finest bear dance you ever saw. He held his hands on his head, and judging from his remarks he was not muzzled. Looking around to see the cause of so much friskiness I saw an old set of the "windmill" stocks and dies leaning up against the side of the bench.

The fitter's foot had slipped and he got a tap on the "knob" and so he was relieving his feelings on the occasion. Ever pull on a set of those cussed man killing tools? If you did, then you know the amount of muscle that was thrown away. There was a makeshift that we sometimes made use of (when it did no good to ditch the bum tools) in order to force the tool to "catch." We slid a pinch bar through the die and into the pipe and, leaning a board against the floor and under the bar, we caused the die to take hold by main force. I have worked over half an hour sometimes just to catch one thread, and after it was cut had it all chewed up.

Thank goodness that some of the bright minds in the country have invented stocks and dies that will almost do the work without having to use any muscle at all. I expect to see the time when you can punch a button and the thread will cut itself. We see, every now and then, various stabs in the papers about the plumber and the fitter being so careless about looking after the tools. Well I guess it began about the time of those old windmills and that the boys never recovered after "getting the habit." A man can take pride in a set of good tools, but fails to fall in love with things that grind his life out.

But with the best grade of tools on the market to-day there is no excuse for poor workmanship nor is it necessary to kill one's self at the job, when a 2 in. thread may be turned up with one hand of a man who is just ordinarily strong. I am doing a whole lot of talking at this place for just please remember that **it is the place where leaks begin.**

A small amount of extra care used at this stage of the proceedings may save a whole lot of time later on and save the trouble of having to caulk a lot of leaks, or, perhaps, take out a piece of pipe and replace with a better thread. A reason for many of the poor threads is that the fitter does not know how to adjust the tool properly. Another thing that gives poor work is the lack of good lard oil on the job. "The other oil is just as good," some party may tell you and sting you for several gallons.

Don't you believe it. Stick to the old reliable, and avoid trouble. But even with the best of threads cut as proper as may be, it is mighty easy to have a lot of leaks on the job from the want of attention in screwing the fittings on the pipe.

In putting on a fitting lots of workmen will grab a piece of pipe smaller than the size of the fitting and ram the pipe into the tee or ell as the case may be and then slam the fitting on. This is a careless trick for several reasons and apt to lose time rather than to prove a gain. In the first place you will most likely jam the threads inside the fitting very badly. Secondly, with so long a leverage, you lose the sense of muscular proportion and will be very apt to put the fitting on too far and crack it. A wrench was made for that purpose. Some people claim hat the wrench "chews up" the ell or tee on the rim. Well, then put the wrench to the fitting as it should be. It is not necessary to place the wrench on the rim of the fitting at all as a much safer and better hold can be obtained by putting the wrench over the middle of the fitting and never removing the wrench until the fitting is made up to the extent that you deem necessary. After this manner no fitting need show any edge chewed up.

There always has been and still remains a considerable number of men in the craft who imagine that they can prevent most any kind of a leak by the use of some kind of "dope" applied internally or externally to the fitting, so to speak. White lead and red lead used to run neck and neck as favorites for this purpose, especially on plumbing work.

I used to make a pretty fair article which I learned from a "down east" fitter. It consisted of both white and red lead with some iron dust and was mixed in oil. When a leak appeared this was daubed on the outside; sometimes it held and then again it didn't. I spent more time trying to cobble up the leak than it would have taken to pull the pipe out and put in an entire new piece.

That's one phase of the situation that never seems to occur to a person until the deed is done. Some graphite for "dope" is all right, but it needs to be mixed with discretion so as not to be plastered all over. It assists the fitting to turn up easier and will prevent the joint from sticking, if it is necessary to open same some time in the future.

Phoenix.

HEATING WATER FOR DOMESTIC USE.

A heater now in use where large quantities of hot water are wanted nearly every day is illustrated in Fig. 1. This heater is filled with steam at 2 pounds pressure, and a coil of brass pipe gives ample surface for the transmission of heat. The inlet and outlet of this coil is shown at the top and bottom.

Fig. 2 shows one hot water faucet and a section of the piping. Cold water is delivered by the lower pipe to the heater and coming from the heater it passes through the upper pipe to the faucet shown. If only one pipe was installed it would be necessary to draw all of the cold water out of the supply pipe before hot water could be secured at the faucet, but the original installation was fitted with a return pipe which maintained a circulation, hence after hot water was once secured at the faucet it was there ready to flow at any time during the day.

On looking over this plant when it was new, I could see no reason why cold water could not flow up the return pipe and be delivered to the faucet. To prevent this action I put a check valve in the return pipe at 2. It was

of the swing type, in order to open easily, as otherwise it would not operate, as the difference in pressure in such a system is very slight.

This device worked perfectly for a long time, but after several years service, water was not heated to a high tem-

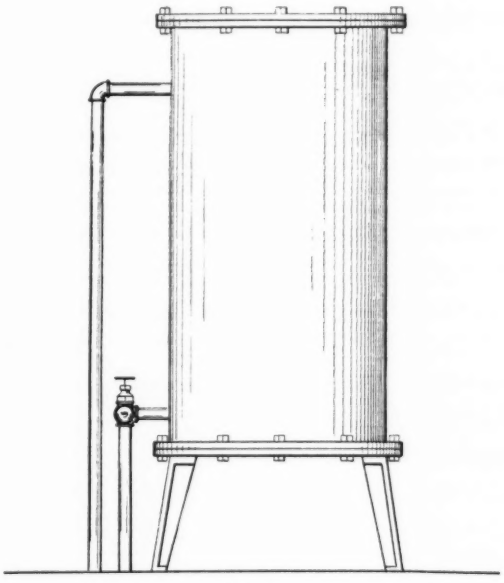


Fig. 1.

perature, and sometimes it was only warm, consequently we were never sure of getting what was wanted.

After considerable trouble along this line, I concluded to disconnect the return pipe at the check valve 2 and put plugs in the openings, as I believed that the check valve leaked badly, thus allowing cold water to flow up the return pipe. A swing check valve will leak worse some days than others, because the clapper does not always seat in exactly the same place. The loose hinge with which they are usually fitted allows the clapper to move sidewise, and this proves objectionable in practice. This accounted for the changing action which resulted in different temperatures of the water delivered when it should have been always about the same.

Although this eliminated what was formerly a valuable feature, the result is satisfactory. Of course we do not get hot water as soon as the faucet is opened, as cold

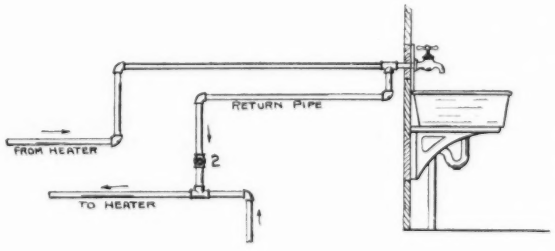


Fig. 2.

water standing in the pipes must be drawn off first, but after a short delay on this account hot water always comes, and that is the main point to be considered.

Several days before this change was made, the supply of water for this faucet began to slowly fail, the pressure grew less and finally no water would come at all. This would naturally give the impression that the supply pipe gradually filled with sediment for some unknown cause, but a thorough investigation before taking down any of the piping showed that a gate valve in this pipe was shut tight. This valve is not shown in the illustration. Somebody had evidently given the wheel of it a turn occasionally until it was completely closed, thus hoping to cause trouble for all concerned, but the plan was only partially successful. W. H. Wakeman.

ANNUAL MEETING OF THE MICHIGAN MASTER PLUMBERS' ASSOCIATION.

The twenty-first annual assembly of the Master Plumbers' Association of Michigan was held at Kalamazoo on Tuesday and Wednesday of this week. The importance of this annual meeting was apparent by the fact that there were in attendance the largest number of delegates ever gathered at an annual meeting of the organization. The report of the committee on credentials read during the opening session showed that there were in attendance nearly one hundred and fifty of the members. The sessions were the most successful and beneficial to the membership and trade in general in the history of the Michigan Master Plumbers' Association. Various subjects of vital importance were discussed at the opening session of the convention, and after adjournment for luncheon on the first day the delegates were escorted by the entertainment committee of the Kalamazoo Local to the plant of the Bryant Paper Mills. All departments of this mammoth institution were inspected and vastly appreciated by those who attended. The second session of the convention, held on Wednesday morning, was devoted largely to regular routine business, after which the convention went into executive session for the consideration of intricate problems with which the organization as a whole is confronted. The convention re-convened at 3:30 on Wednesday afternoon and during this session the following officers were elected for the ensuing year:

Geo. McCullom, of Muskegon, president; James A. O'Neill, of Kalamazoo, vice-president; Wm. A. Decker, of Grand Rapids, secretary-treasurer.

Mr. Decker was also elected vice-president of the National Association of Master Plumbers for the state of Michigan.

S. H. Morgan, of Detroit, was elected delegate to the National Association convention, which is to be held in Salt Lake City. W. W. Wood, of Detroit, was elected alternate delegate.

A complete detailed report of the proceedings of the Michigan Association convention will be published in "Domestic Engineering" of April 6.

Answered.

"You, there, in the overalls!" shouted the cross-examining lawyer, "how much are you paid for telling untruths?"

"Less than you are," retorted the witness, "or you'd be in overalls, too."—Housekeeper.

Reasonable Restraint.

Jones—"Is it necessary for you to send your daughter to Europe to complete her musical education?"

Brown—"Yes; I can't stand the infernal racket here any longer."—Portland Oregonian.

A Uniform and National Plumbing Code

Suggestions About How It Should be Written and What It Should Contain—Standards to Which New Materials Should Conform

By Henry D. McCormack, C. E.

XXIV.

Slip-Joints in Plumbing.

Fifteen or more years ago the city of New York took a firm stand against the use of slip-joints on the sewer side of fixture traps. The commissioners having in charge the compiling of a new code, or revision of an old one, found that the good accomplished by requiring extra-heavy cast-iron pipe, and other approved standards of size and weight was being negatived by the use of that abomination in plumbing practice, the slip-joint. True, nobody at that time had the temerity to use it for the outlet of a fixture resting on the floor, but its use had become so extensive for basins and other small fixtures that the plumbing department was forced to adopt the following provision:

"The connection of traps must be made to main soil, waste and vent pipes by means of lead calked or screwed joints. Connections on brass pipe and between brass pipe and traps on iron pipe must not be made up with slip-joints or couplings."

Ever since the publication of that provision the sentiment back of it has been strengthening, until at the present time there is not a city having a code where that insanitary form of connection can be used. The necessity for prohibiting a slip-joint in any part of the drainage system, on the sewer side of the trap, is so well known and understood that it is unnecessary to emphasize it here. It might be well, however, to give the provisions of the latest compiled codes, which, by the way, are among the best codes in the country. In the Cleveland, O., Code will be found the following:

"Slip-Joints and Unions—All unions used on the sewer side of traps shall be ground faced. The use of slip-joints and lock-nut couplings on the outlet or drain side of any trap shall be prohibited inside of any building."

The state of Ohio in compiling its very satisfactory code, could travel far without finding a better provision to adopt, therefore it took it bodily, improved it by editing, and we have this to show for its labor:

"Connections between wrought-iron or brass to cast-iron shall be either a calked joint or a screw joint. All unions used on the sewer side of traps shall be ground faced and shall not be concealed or enclosed. No slip-joint connections will be allowed on the sewer side of a trap."

But why follow the subject further? Every code worthy of the name has a similar provision, however worded. Some of them state explicitly the only kinds of joints that will be permitted, without including the slip-joint, while others content themselves with a sweeping prohibition of the slip-joint, without specifying what forms will be acceptable.

So far, slip-joints have been used only on 1½ and 2-in. pipes. It stands to reason, though, if they are objectionable there, they would be more than objectionable on a 4-in. soil pipe, rain-leader, slop-sink or other large size pipe. But the compilers of codes need not fear the use of slip-joints spreading, if they adopt some form of expressing their disapproval, similar to the forms used in the Cleveland and Ohio state codes. This will effectually prohibit the most objectionable form of joint that ever crept into plumbing practice.

Standards to Which New Materials Must Conform.

This is an age of progress, and in compiling a code it is well so to word it as not to lock up the right to use improvements until time and progress has left the city code far behind. This danger is not so remote as it might seem. At the present writing, the city of Wilmington is forced to use rubber gaskets, and nothing else is permitted, in connection with closet floor flanges, while for a long time plumbers have been anxious to adopt the new and improved flanges now on the market. The authorities find themselves, however, powerless even to permit their use, because the materials that can be used for that purpose are expressly restricted to rubber. Asbestos, graphite-asbestos, metal-to-metal, all have to await the revision, which will be adopted in a month or so.

New York City is just such another case. The New York code expressly calls for putty-joints—just think of that, in New York, and in the year of grace, 1912—and nothing else can be used—within the sanction of the law—in that city.

That came, of course, from not being able to peer ahead into the future to the time when something better would be offered. At the time those two codes were adopted, there was nothing better to be had, and the putty flange was as far ahead of the old method of working the lead over the floor without any flange, as the present day metal-to-metal flanges are ahead of putty and rubber gasket flanges.

But the lesson it teaches is what we are most interested in. What we want in our uniform and national code is such a wording of the various provisions that it will automatically exclude everything below a certain standard of excellence, and at the same time admit everything which is in any degree better than the standard.

How this can be accomplished without leaving it to the judgment or discretion of the inspector or plumbing department is one of the problems to be worked out. No one individual, however, ought to have this authority without the right of appeal. Granting that the inspector's motives would be honest and fair, still, there is the possibility of his erring in judgment, to the disadvantage of the community and loss of the individual.

If there were a national department of plumbing, where experts were employed to try out and test all new contrivances, that would be the solution of the problem. Anything which received the O. K. of that department would be accepted in any locality.

The personnel of that department should be above reproach, however, not only as to honesty but as to ability as well. Men of broad engineering or scientific training should be chosen in preference to a practical man because he can wipe a joint or cut a thread, for the principles on which a device is constructed must be taken into account, and the writer has seen good, honest, sincere, practical

men, journeymen and inspectors, condemn devices of incalculable merit because they did not understand them, and at the same time accept veritable abominations as perfect, because they caught their fancy and looked good to them.

Lastly, I do not know as I would sanction a central body after all. Knowing intimately the working of the United States Land Department for the past 25 years, which culminated recently in a national scandal in Alaska, and having in mind the plotting and counter-plotting in the Department of Agriculture, I doubt whether the best interests of the people would be conserved by having a National Board. After all, I have great confidence in the people themselves. If the plumbers, the architects and the public in general are given half a chance, each community will work out its own salvation to its own satisfaction and will not be far wrong at that. All that is necessary is to call in one or two experts when a code is to be compiled, let them co-operate with the local plumbers' association and the architects, and no fear need be entertained of the result.

(To be Continued.)

"IN HOG SIGNO VINCES?" SAYS THE MEDICAL APOLOGIST.

Some of the proponents of a national board of "health" state the case thus:

"A farmer has a sick hog. He sends to the Department of Agriculture and the Government at once sends him an expert—a hog doctor—to attend to the hog.

"A poor woman has a sick child. She appeals to the Government, but the Government has no department which will or can do anything for her suffering baby.

"Shameful! We need a department of medicine (or call it 'Health') to protect our babies as we protect our hogs."

Now this is an alluring argument. I admit its appeal, and I should dearly love to believe in it, for the protection of childhood is a tender point in all rightly constituted minds, and if a "paternal government" really were **paternal**—or, better still, **maternal**—there might be something in the argument.

But, as a matter of fact, a Government is not a God, beneficient and omniscient, as some people seem to think. It is man-administered, and is no better than you and I make it by constant attention to the making.

Once we let go of it and leave it to some public official to make it for us we are pretty certain to suffer, and we always let go of it when it becomes **departmental** government.

It is so easy to shirk every question, every personal and public responsibility and say: "O, let your Uncle Samuel take care of it!" One would think that Uncle Samuel really existed as a kindly old gentleman, without passions or prejudices, without self-interests or self-seeking associates—just a lovely, lonely relative longing to do us good.

This conception is all very well for poetic, artistic or oratorical purposes, but we are practical men and women, and we have had too many "uncles" anxious to "do us" good, and so we refuse to put ourselves or our children in hock to any uncle.

"But shall our hogs have protection and our children none?" piteously pleads the Medical Apologist.

It depends upon what you mean by "protection," but if you mean the governmental control of children with the same authority over them that Government has, or can have, over hogs (as your argument plainly indicates) I answer: "Protect our hogs, but spare our children."

You who are impressed by the Hog Argument, suppose you follow it to its logical conclusion.

If cholera breaks out among your hogs the Government can step in and kill them. That's part of the hog protection game. Or if the governmental killing of hogs with cholera be unusual, certainly the killing of other diseased animals is not. If your horse has glanders, if your cow has tuberculosis, the Government knocks them on the head to protect other horses, other cattle. Well and good, perhaps, but does that strike you as a practical plan to apply to children? Would you like to have your children killed off by a Government official for their "protection" should they become diseased?

Don't say this is absurd. Of course, it is absurd to a mind which **refuses** the hog argument, but if you **accept** the hog argument it is the logical deduction and just a little more absurd than your original hog argument, because carried further in order that you cannot escape seeing its absurdity.

Then when your little hogs—I beg pardon, I mean your children—become older, you may have expert advice from the Government as to how to breed them, how to marry them, how to cross them so as to get better children—or hogs—than have been produced thus far. Perhaps your children are white and your hogs are Poland Blacks, while your neighbor's children are black and his hogs are Chester Whites. Along comes a Government expert, perhaps, and advises you that you can obtain hogs and children better able to resist certain diseases if you cross your children and your hogs with your neighbors. What would you do to the expert? Hold on! You wouldn't do any such thing as you are saying you would. You have been crying audibly because the Government wouldn't advise you about children as it does about hogs, and now that it gives you advice about human offspring along the same lines it advises about hog offspring you ought to accept it gratefully. Stand by the hog argument and accept its logical deduction!

Heaven forbid that I should resurrect the race question in this controversy or add one finger weight to race prejudice. But while I utterly abhor miscegenation I am not prepared to say—(is anyone prepared to say?)—that a mixture of race bloods **might** not produce a physically superior, a better disease-resistant race. At least, it is easily conceivable that some Government expert might eventually work out some such theory in his laboratory, and if children are to be considered as hogs he would be thoroughly justified in improving the breed by exercising such departmental authority as he would possess.

The answer to the hog argument is obvious. It consists of four words:

Children are not hogs.

BUSINESS VENTURES.

Salem, S. Dak.—B. B. Pollard has opened a plumbing establishment here.

Lafayette, Ind.—Edward R. Overesch Co. has been incorporated with a capital of $6,000 to conduct a plumbing business. The incorporators are Edward R. Overesch, Daniel DeLong and O. E. Bates.

Manhattan, Mont.—William Tyrrel has opened an up-to-date plumbing establishment in the Williams building in this town.

Topeka, Kan.—The Bobb Bros. Plumbing Co. has opened a plumbing establishment here.

Leeds, Ia.—A. S. Burke has opened a plumbing establishment here.

Carthage, Ill.—Albert Fox has opened a plumbing business in the Taylor building on Wabash avenue.

Hannibal, Mo.—J. T. Hanrahan has opened an up-to-date plumbing and heating business at 106 Market street.

THREE HEATING QUESTIONS.

Editor "Domestic Engineering":—I would like to have expert heating engineers among your readers enlighten me on the following subjects:

What advantage, if any, would be gained by burning coal of size commercially known as pea instead of egg or furnace size, in the average cast iron sectional steam boiler having a capacity of about 1,800 sq. ft. of radiation and a grate area of about 1,200 sq. in.?

What would be the cause of the repeated breaking of the sections of a cast iron vertical sectional steam boiler? Apparently the boiler is properly connected to the mains, and has not been fed with cold water when water line was low, nor overheated. New sections which replaced the broken ones, broke in the same place within a few days after being put in use.

What would cause a cast iron boiler to "sweat," i. e. to cause dampness and water to appear on the bottom of the overhanging fire surface, when the boiler is in use? I have come across two instances of this kind within the past few weeks; one on an old boiler, and the other on a new boiler, both steam boilers of the same make, style and capacity, and working on about the same conditions.

New York City. J. S. D.

A QUESTION ABOUT EXPANSION OF JOINTS.

Editor "Domestic Engineering:"—Will you kindly answer the following question: The installation of 4-inch and 2-inch cast iron soil pipe stacks is required for toilets and lavatories in a building of 200 feet elevation, wrought iron pipe being prohibited.

We wish to know whether the best material for joints is lead and oakum or a certain amount of composition. What is practical or customary in pipe stacks of this height?

Will damage result to the lead joints from crawling of joints by expansion, corrosion or deterioration of the lead?

Norfolk, Va. W. M.

For a building 200 feet high 4-inch and 2-inch soil stacks appear to be a trifle small, but as the query is in regard to expansion of the joints, we will not discuss pipe sizes.

When soil, waste and vent stacks are run in high buildings, under ordinary conditions, no special provision needs to be made for expansion.

The stacks should rest on a solid foundation and be supported at each floor to allow for each floor to carry its share of the weight and to prevent vibration in the stack. Due care should be taken that branches are not run too close to the under side of beams, as settling of the beams might result in leaks.

There is flexibility enough in the connections to the fixtures to allow for any ordinary settling of the building. It is presumed that the volume of hot water flowing through the stack is a very small quantity and need not be considered in figuring the expansion in same. Presuming a temperature variation of perhaps 40 degrees during the year, in a cast iron stack approximately 200 feet high, the expansion would be less than ¾ of an inch, and distributing this through about 75 joints in the vertical stack, the question of leaks in the joints due to expansion can almost be ignored. As the walls of the building will be approximately the same temperature as the stack, they will expand and contract in about the same ratio. Lead and oakum joints, properly made, should give good results, without the use of anything else.

HOW TO MAKE A DAMP AND MOLDY VAULT DRY.

Editor "Domestic Engineering"—Very recently we have been called on a job for one of our customers who is operating a brewery. In a part of the basement of this brewery he has a fireproof vault built, in which they file away papers of any value, records, etc. This vault is giving them considerable trouble at the present time, as the room is damp and moldy and has the same effect on the contents. We have several different ideas in mind to remedy this at the present time; one is to put a small coil in the vault and to make a couple of openings in the wall for a circulation of air. Will you kindly tell us how we can solve this problem?

Defiance, O. H. C.

The best remedy for the damp and musty condition of the vault will be to circulate plenty of fresh air through same. Placing a steam coil in the vault will not eliminate the trouble to any extent unless the air is circulated through it.

The following schemes will give the desired results provided the conditions of the building will permit it. Bring a supply of fresh air from out doors, say at a point of two or three feet above the ground line, into the vault at the bottom, through a galvanized iron duct. Take the galvanized iron duct from the vault at the ceiling and carry up to and through roof and cap with a Globe ventilator. The size of the vault is not given, but both ducts could be approximately six inches by eight inches; twenty feet of one and one-half inch pipe, supplied with steam, placed in the duct leading away from the vault, will improve the air circulation. It will not be necessary to warm the air coming into the vault, unless the air supply source is from a point where there would be danger of getting considerable damp air at times.

This problem could have been handled a little more intelligently if we had received more definite information. After the above scheme is installed, it will be approximately a month or more before the odor will be eliminated.

The placing of a steam coil in the vault, with the duct arrangement described, will give good results. Placing a small electric driven fan in the air supply duct to the vault will also give good results. The one and one-half inch pipe in the duct leading away from the vault may be omitted if the fan is used. With the above suggestions, musty condition of the vault and contents will be eliminated.

What the Law Decides

Recent Court Decisions of Interest to the Plumbing and Heating Trade, Handed Down in Michigan and Arkansas

What Constitutes Unfair Competition in the Eyes of the Law.

It has been held that the unnecessary imitation by one manufacturer of the nonfunctional parts of the product of a competitor, to the extent that the two articles are substantially identical in appearance to a casual observer, and retail purchasers thus likely to mistake one for the other, amounts to unfair competition, although each feature taken separately may have been open to appropriation. But the United States Circuit Court of Appeals, Sixth Circuit, holds, in Edward Hilker M. Co. vs. Company, 191 Federal Reporter, 613, that the adoption by one manufacturer of the characteristic features of another's product, common to articles of that class, does not of itself amount to unfair competition. The rule is well settled that nothing less than conduct tending to pass off one man's business or merchandise as that of another will constitute unfair competition. And the United States Circuit Court of Appeals, Ninth Circuit, holds, in G. Heileman B. Co. vs. Company, 191 Federal Reporter, 489, that a suit for unfair competition may be maintained where there is no lawful trade-mark involved, which consists essentially in palming the goods of one manufacturer or vendor off for the goods of another. This is a fraud not only upon the manufacturer whose goods are assimilated and replaced in the market, but upon the general public as well, which does not get what it supposes it is bargaining for. For the fraud thus perpetrated, the individual or the manufacturer, as the case may be, has his or its cause of suit to prevent the recurrence of the imposition, and for such damages as may have been sustained on account of it.

Points Favorable to Action for Extra Compensation for Covering Pipes.

The plaintiff in an action to recover $135 for alleged extra work for covering the steam pipes under a church with asbestos had for many years been engaged in the business of plumbing and steam fitting, and had received the contract for the steam fitting. The contract itself had apparently been lost, but the specifications provided, in part, "Pipes Underground: To be thoroughly protected from freezing must be deep enough to be boxed in wooden boxes 3 ins. larger than pipe, pipes must be covered with magnesia and felt, enough to afford good service. The putting in of heating apparatus must be done complete in every respect by the heating contractor; all necessary tools for boiler, etc." "The covering pipes underground may be done with crock of sufficient sizes." The Supreme Court of Michigan holds, Wenzel vs. Kieruj, 133 Northwestern Reporter, 921, that the heating specifications should have been construed by the court, and that the jury should have been instructed as to their meaning and import, and that they did not embrace the work sued for in this action. The plaintiff was entitled to have fully submitted to the jury his claim that, by a subsequent oral contract with the architect and the defendant, he was authorized to cover the pipes and charge for the same as an extra. Moreover, the rule of law is that prior mutual understandings of the parties are unimportant, when they have signed a contract covering the subject-matter, since the latter includes and covers all such prior negotiations and agreements. The general rule is that you cannot import into a written agreement a prior oral agreement which alters the terms or legal effect of the written agreement.

Rights Under Contract for Heating Plant.

In an action brought to recover a balance claimed to be due for installing a heating plant, it appeared that, according to the terms of the written contract introduced in evidence, the plaintiff agreed, for the stipulated price, to install the plant, "the said heating apparatus to be placed in said building in such manner and located at such a point as shall be deemed best by said heating company for its most successful operation, it being guaranteed that said heating apparatus shall be constructed thoroughly in all respects, of good material, and made smoke and gas tight, and that, subject to the requirements hereinafter specified, such heater shall furnish a pure, moist air and have a capacity to provide a temperature of 70 degrees for the building in the coldest and windiest weather."

The Supreme Court of Arkansas, in affirming a judgment in favor of the defendants, allowing them their counterclaim for $350 which they had paid on the contract price, says, Campbell vs. Kennerly & Dorr, 143 Southwestern Reporter, 97, that the law is settled that a contractor of this sort cannot recover unless there has been a substantial compliance on his part with the terms of the contract, or, in other words, unless he has furnished the material and performed the work substantially as provided in the contract.

To the contention that there was a decided preponderance of the testimony of witnesses introduced by the plaintiff who showed an accurate knowledge of this kind of work, and that the testimony of many of the witnesses upon the part of the defendants should be disregarded on account of obvious lack of such knowledge; that there should be a considerable degree of expert knowledge on that subject before the testimony of witnesses could be accorded any probative force, the court simply answers that it duly considered these matters, and, upon the whole, was convinced that the state of the testimony was such that it was impossible for it to say that there was any preponderance in the plaintiff's favor.

But, inasmuch as the defendants rejected the work and refused to pay for same, it was still the property of the plaintiff and might be removed from the premises as far as that could be done without injury to the building.

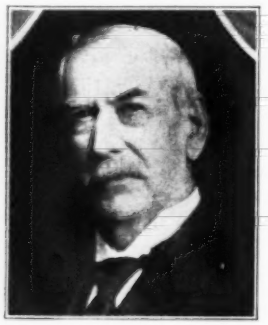
JOHN H. LYONS DEAD.

John H. Lyons, senior member of the plumbing firm of John H. Lyons & Co., 922 Peach street, Erie, Pa., died at his home in that city on Tuesday morning, March 19th, after a short illness, in his 57th year. Mr. Lyons was born in Buffalo, N. Y., and came to Erie with his parents in 1860 when he was only five years old, and he lived there ever since. He learned the plumbing trade and started in the plumbing business on his own account about 1880. His place of business has for more than twenty years been established at 922 Peach Street. He had a sunny disposition which made him many friends.

OBITUARY

Andrew Young.

Andrew Young, past president of the National Association of Master Plumbers and formerly chief sanitary inspector in Chicago, died suddenly of heart failure in Mobile, Ala., last Monday, March 25th, while on a visit in that city. Mr. Young was born in the village of Bonhill, near Glasgow, Scotland, August 1, 1840. In 1854 he left Scotland and came to Chicago, where, in 1855, he engaged as an apprentice with Mr. Alexander Raffen, the first plumber in Chicago. He served a term of five years with Mr. Raffen and thoroughly learned the principles of the trade. He took a deep interest in the advancement of the plumbing trade, and it was due largely to his efforts, as president of the Chicago Master Plumbers' Association, and the efforts of the members whom his enthusiasm gathered to his aid, that the Chicago association has stood so high among others of its kind. Mr. Young was elected first vice-president of the National Association of Master Plumbers in June, 1883. At the second meeting of the National Association of Master Plumbers at Baltimore, June 26, 1884, Mr. Young was chosen by acclamation president of the association. Mr. Young laid great stress upon the education of the plumber and the public as well, to a recognition of the value of sanitary work. His idea was not confined to sanitation in plumbing work simply, but he desired to see all the branches of sanitary work advance. His first official promulgation, as president of the National Association, was one urging the master plumbers' associations to organize into auxiliary sanitary corps, to co-operate with local health authorities. This circular letter was widely and favorably commented upon and acted upon as well. His idea was to educate the people to demand good work, as well as to create a desire on the part of the plumbers to do it. On Sept. 8, 1884, Mr. Young was appointed by the Governor of the state of Illinois, as commissioner of the sanitary exhibit at the World's Fair in New Orleans in that year, and he had charge of all the sewerage, sanitary exhibits and the sanitary work in connection with the exhibition. He was appointed chief sanitary inspector in Chicago on June 1, 1889, and he held that office until November 17, 1903, when he resigned on account of failing health. After his resignation he spent some months on the Pacific Coast trying to regain his health and with partial success. Later he went to New Mexico. From there he went to Citronelle, Ala., where he spent the last years of his life. His deep interest in the National Association of Master Plumbers and the Chicago Master Plumbers' Association remained with him to the end, and he was always in close touch with the work and the progress of these organizations. It was also a source of satisfaction to him that both of these associations conferred honorary memberships upon him. Mr. Young was a confirmed convention-goer, and delegates to the National conventions at Chicago and Galveston will remember the last two papers he wrote on association affairs, respectively entitled "Memories" and "Action." At this writing his remains are being shipped to Chicago, where funeral services will be held at the home of one of his children, and the Chicago Master Plumbers' Association is making arrangements to honor his memory in an appropriate manner.



The Late Andrew Young.

John W. Essman.

John W. Essman, member of the plumbing firm of Kegelmeyer & Essman, of Columbus, O., died at his home in that city on Thursday, March 14, in his 45th year. He is survived by his wife.

THE METAL MARKET

COPPER SELLS AT FIFTEEN CENTS.

The long awaited event, the sale of copper at fifteen cents, came last week. The quantity of metal sold at that figure was not large, but it was enough to establish the price at fifteen cents. There is nothing specially significant in the sale of copper at a round figure like this, except the price mentioned has always been considered a very fair one by both the mining interests and consumers. It is now nearly five years since copper sold at this figure, and previous to that in the boom of 1906, sales were made as high as twenty-five cents. Manufacturers of brass goods will recall with a good deal of bitterness the fact that they bought considerable metal at above twenty cents a pound, and were obliged to sell the goods made from this metal on a basis of twelve cents a pound.

Will such a condition confront the trade again? This question is being asked on many hands. We believe it will be a long time before a "runaway" market of this character will be seen. In the first place, the bitter experience of a boom such as that in 1906, should last a generation, at least. Furthermore, stocks of copper, invisible supplies, are large all over the world. Manufacturers with idle funds purchased a great deal of copper at around twelve cents, and are keeping it as a sort of insurance against the day of high prices. The great military establishments in Europe added to their resources and the governments of France and Germany bought metal to hoard away in time of need. An authority in this country suggests that possibly American manufacturers can be supplied from Europe, if the necessity arises.

SPELTER.

This metal continues scarce and sales have been made as high as seven cents.

LEAD.

Prices are high and sales were made early in the week at 4.35 cents New York.

Scientific Management Applied to the Heating Industry

How the Temperature, Experience, Age, Health, Training and Mental Aptitude of the Worker Affect His Work.

By Chas. S. Kellum, M. E.

(Continued.)

Temperament.

Temperament, that highly variable and undefinable quality in the human which makes us all different and distinct beings, should play an important part in the grading of workers. Temperament automatically fits men into a particular niche in life and the more quickly we analyze and classify the temperament of the worker, the faster and further will be our progress in the science of management.

The dynamic, restless temperament usually classifies a man as a leader and pusher of work, while the restive, analytical, reasoning temperament gives us the planner of work and the skilled artisan.

Show me a man who is restless, impulsive and continually fretting at his work and I will show you a man who when properly developed will make a leader of workmen.

Sullen temperaments are not natural and are often the result of an unfair and partial management. It requires keen insight and a wide knowledge of human nature to deal with different temperaments, but the results are very evident.

Experience.

Previous experience is obviously an element to be considered. Experience should not play an all important part in selecting men. There is actually a great variance to the old saying "You can't teach an old dog new tricks."

Workmen of experience must sometimes be taught to unlearn and learn anew, but records prove that this process is usually more rapid than teaching a green man to become an expert worker. Experience gives a man an indescribable "feel for the work" and "play for position," which is not possessed by the novice.

Experience in the case of a foreman is so obvious an asset that we will not attempt to discuss it here.

Age.

Age according to Dr. Osler has well defined limitations, but so many other prime elements affect man that age is a lesser consideration in the selection of men. While this is the young men's era, the old men with the greater experience and riper judgment have their place in the ranks and it lies with the manager of men to place age where it can do the most good.

Income.

Income should be based on individual productive capacity where possible; that is, the results should determine income—this will simplify the work of standardization immensely, not only in keeping the classification between workmen, but also in placing relative value on different kinds of work. We will discuss the bearing of income later under "Wage Systems."

Habits.

Habits not only as to mode of life, but also as to work bear a close relation to experience. That the acquisition of good habits of work promote efficiency and versatility in the worker, is one of the cardinal principals underlying successful management. This is aptly stated by Mr. Gantt in his work on "Work, Wages and Profits." He says: "The habits that a man has to acquire in one class of work stand him in good stead in becoming efficient in other work. These habits of work are vastly more important than the work itself, for it is our experience that a man who has become efficient in one thing, readily learns to become efficient at doing other things."

Man's habits are so much a part of himself that chapters could be written on the effect of these upon his work. But it is a self evident fact that a man's clearness of brain and strength of muscle depend very much upon his habits of temperate eating and drinking, and of right living. Likewise the speed and accuracy of his movements are the results of acquired habits of concentration on his work and of simultaneous action of many muscles in different parts of his body.

Health.

The health of the worker is such a complex variable that we can control it only in a measure locally. As men's habits of work improve, their health improves, but beyond this, managements can only advise and counsel. Many large industrial concerns who realize the importance of the perfect health of their men have special departments called, welfare departments, whose duties consist in promoting healthful and hygienic conditions at shop and home.

The National Cash Register Company of Dayton, Ohio, has such a department. This company has baths for the workmen, recreation grounds, and in all endeavors to give the men an opportunity to enjoy the privileges of perfectly hygienic surroundings.

These efforts to maintain the physical side of their employees at a high level are too extensive for imitation in the steamfitting contracting business, but they serve to indicate how important an element these great concerns consider health. In a lesser degree the heating contractor should be equally concerned in the physical condition of his men, even though he considers it entirely from a selfish dollar and cent standpoint.

Mode of Life.

Mode of life has been touched upon under health and habits and merits investigation. Many companies such as the Pullman Company have endeavored to standardize their workmen's mode of living by renting them houses which are all built alike.

Training.

The training of men in the performance of work, the doing of which has been standardized to the minutest detail, motion by motion, requires all the skill and tact possessed by the management.

Previous training as outlined under Experience is a factor to be considered, and rash is the manager who expects that men will learn to perform a standardized operation quickly.

The process is slow at best and ofttimes futile, but when once accomplished is done forever. Training

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should be watched closely by the management. Of the general apprentice system now in vogue Mr. Gilbreth, in his book "Motion Study," says: "The present apprenticeship system is pitiful and criminal from the apprentice's standpoint, ridiculous from a modern system standpoint, and there is no word that describes its wastefulness from an economic standpoint."

The fitter himself, the man who has learned his trade in the school of experience and hard knocks, varies as to his ability as far as the north is from the south. Some are woefully ignorant of the elementary practices and laws of their trade, and even the most expert can pick up here and there little tricks and bits of information that will help them daily in their work. None of us are so wise or so skilled that we can't learn some one thing from even the most ignorant, and it is always the best workman who is the most progresssive and most anxious to learn. The employer, therefore, by tact and patience can steadily improve the practice of his men, whether skilled or unskilled.

As to the helper—under the present system his training is left almost entirely to the fitter to whom he is attached. That fitter may be an able workman and yet his habits of work may be wrong, his methods unskilled, with the result that the helper is taught to do things wrong, is given misinformation and at the end of his apprenticeship becomes a member of his trade with the tremendous handicap of inefficiency hanging around his neck. The training of his men is worthy of the employer's personal attention. Particularly is this true of the men who are learning the trade. I don't know whether the experiment of a systematic training of helpers has been tried by a heating contractor, but I believe that it would be successful. It seems quite certain to me that an hour a day devoted to teaching the helpers the fundamental principles of steam and hot water heating, to giving them practical lessons in correct methods of threading pipe, etc., would, through the increased efficiency not only of his helpers, but also of his older men, pay handsome dividends.

Mental Aptitude.

The rapidity with which men learn new ways of doing things varies with their mental aptitude. Men mentally active usually make rapid workers while their brothers with the slow and plodding brain seldom rise above the average. Select men with intelligence and of the quick thinking type.

Intensive management must be quick to choose and group first class men by aid of the variable factors above mentioned.

Not only should the proprietor do this but also he should attract first class men to him, for everyone concedes that size and quality of output depends first of all upon the man.

Having analyzed in part those elements of the worker which aid us in classifying him relative to a constant standard, let us proceed with that important and far reaching branch in the category of scientific management—Motion Study.

Motion Study.

Motion study may be defined in a general sense as the analytical study of the relation motions bear to work being done. In motion study we carefully analyze into its time element, each motion that a worker makes in performing a task. As an aid to this the time taken to perform each separate and distinct motion is taken with a stop watch and the bearing each motion has to the task being done is noted on a card form provided for that purpose. Not only the motions are noted but also the task being done, the feed, speed and type of machine and tools with which the man is working. Every minute detail as to those things with which the man works are noted and kept as standard as possible. Dies, wrenches, taps, tongs, etc., should be kept sharp and true, for any deviation in tools and machinery will put a variable element into the study of motion. In industrial shops where scientific management is applied a complete specification is kept on each job. The machine on which the job is to be done, the tools to be used, the speed the machine is to run and the feed of the tool. The department which has to do with the specifications as to how the work is done is called the Planning Department.

In the Planning Department is kept all the information of the productive system. This department has charge of the routing and transferring of work through the shop, the wage systems, the design of the product, etc. In some concerns there is one man in the planning department to every five men in the shop. Even with this tremendous addition of non-productive labor many concerns through the efforts of scientific planning have realized an increase of 100 per cent in production and a unit cost reduction of 40 per cent. While a planning department of such size is impossible in the contracting business, there is no less a reason for an intelligent and systematic mapping out of the work before it is turned over to the men themselves.

The motion study man should preferably be a workman experienced in time study and the work under consideration. Should no such man be available a fast conscientious worker skilled in the work under investigation will answer.

(To be continued.)

DATES OF CONVENTIONS TO BE HELD IN THE NEAR FUTURE.

April 16 and 17, 1912.—The annual convention of the Kentucky State Association of Master Plumbers, at Louisville, Ky. Headquarters will be established at the New Galt House, and the sessions will be held at the Master Plumbers' club-room. The officers of the association are: President, J. J. Fitzgerald, Lexington; vice-president, George Shardein, Louisville; secretary-treasurer, W. W. White, 606 York St., Newport, Ky.

April 23 and 24, 1912.—The tenth annual convention of the Oklahoma State Association of Master Plumbers, in Shawnee, Okla. The officers of the association are: President, W. V. Roesch, Shawnee; vice-president, W. F. Black, Enid; secretary, A. D. McMullen, Oklahoma City; treasurer, Walter Newman, Shawnee.

April 23, 24 and 25, 1912.—The annual convention of the Texas State Association of Master Plumbers, at Fort Worth, Tex. The arrangement committee for the convention is composed of the following master plumbers: W. E. Thatcher, chairman; P. E. Fosdick, Fred Robbins, Wm. Blevins and W. H. Payne, all of Fort Worth.

June 10-13, 1912.—The twenty-fourth annual convention of the National Association of Master Steam and Hot Water Fitters, at Atlantic City, N. J. Headquarters will be established at the St. Charles Hotel. The officers of the association are: President, Edward B. Denny, Newark, N. J.; vice president, John T. Bradley, St. Louis, Mo.; treasurer, Juan A. Almirall, New York City; secretary, Henry B. Gambers, New York City; sergeant-at-arms, John C. F. Trachsel, Philadelphia.

News of the Plumbing and Heating Contractors

Reports of the Week from Many Different Cities Show Both Business and Personal Activity in the Trade

NEWS FROM THE PACIFIC COAST.

San Francisco.

The most active market in the engineering lines at present on the coast is that for pumping engines, centrifugal pumps and riveted sheet metal piping of various kinds. Many agricultural districts on the Pacific slope depend on irrigation, and as the rainfall thus far this season has been below normal, there will be need for much additional pumping equipment. Further, more and more areas are being reclaimed by water pumped from wells or conducted from a distance through pipe. Galvanized iron and sheet steel pipes are used almost entirely nowadays, hence the activity of the riveted pipe manufacturers.

Building activities in San Francisco are increasing gradually, especially in the smaller types of structures, such as apartment houses and business blocks, but as yet the spring season is not fairly begun. Among the more important buildings to be erected here soon are: A big department store for Hale Bros. at Fifth and Market streets, the Standard Oil Building at Bush and Sansome streets, and the Liverpool, London and Globe Insurance Building. The plans for the two latter are now being figured. On the 28th of this month the city will vote on the proposition to issue over $8,000,000 worth of municipal bonds for the purpose of providing funds for erecting the new city hall, acquiring additional land for the civic center, and starting other municipal projects. Also, extensions to the Ferry Building will be made this year, the work to cost $350,000. So the immediate outlook for a brisk season in some of the building trades is very fair. It will be several months, however, before any great improvement is likely in the plumbing, heating and ventilating trades.

A new State organization of importance was launched this month at a general convention of sub-contractors held at Sacramento on March 7 to 9, and the official title of the organization is the Organized Contractors' and Dealers' Association of the State of California. The association is made up of master plumbers, sheet metal workers, electricians, painters, millmen, and other masters' associations, together with various material dealers. The stated purpose of the organization is to bring about a better condition in the building trades for the sub-contractor, and the dealer in building materials. It is also designed to promote harmony between the contractors and the labor unions. By reason of trouble with general contractors, who often discriminated unfairly against the sub-contractor by holding back payments, etc., it was found advisable thus to unite forces and advocate a more equitable contract system. This is not intended to antagonize the legitimate general contractor who has money enough to carry his contract, but to protect the sub-contractor from irresponsible general contractors, and in other ways encourage building and insure just profits. Over a hundred delegates attended the convention, and the place chosen for the next annual meeting was San Francisco. The officers elected for the year are: President, W. S. Simmonds, of Sacramento; first vice-president, J. E. Steere, of San Francisco; treasurer, T. E. McShane, of Sacramento; secretary, Frank Smith, of Sacramento. A number of second vice presidents, an executive board and various committees were also chosen. A systematic affort is soon to be made to greatly increase the membership in the association.

L. V. Rice, buyer for the Mark-Lally Co. has returned from a ten days' business trip up the Sacramento Valley. He reports trade conditions there very good and that the prospects are very bright for an active building season.

Anson Mark, of the Mark Manufacturing Co., of Evanston, Ill., and Zanesville, O., is in San Francisco this week calling on local plumbing supply houses.

P. G. Ekberg, of Auburn, Cal., has sold his plumbing and heating stock and business to I. W. Vanderbilt and J. H. Williams of Ione, Cal.

The Watsonville Plumbing & Supply Co., capital stock, $10,000, has been organized by Peter Senegrini, of Santa Cruz, Cal., and Al Radoni, of Watsonville, Cal.

H. D. Hubbs has been awarded the plumbing contracts on three Polytechnic School buildings to be erected in San Diego, Cal. The board of education rejected most of the bids for other work. The buildings will cost $214,000.

C. N. Peckham has succeeded to the plumbing business of William Stokes at Ceres, Cal.

The low bid for the heating and ventilating work on the new grammar school at North Stockton, Cal., was submitted by W. Morgan & Co.; amount, $1,791.

It is announced that Mr. Reynolds, of the plumbing firm of Finlay & Reynolds at Salem, Ore., has retired from the business.

The officials of Whitman College at Walla Walla, Wash., are taking estimates on a complete new plumbing system for the institution. As a result of a recent order of the city commission the college may have to install a private water system.

HAYS & EASTMAN A PROGRESSIVE PLUMBING CONCERN.

The Hays & Eastman Plumbing & Heating Co., of Monmouth, Ill., is one of the many progressive concerns in the plumbing and heating industry. There have been many different stages in the progress of the Hays &

The New Business Home of the Hays & Eastman Plumbing & Heating Co., in Monmouth, Ill.

Eastman Co., and the most recent was the finishing of a new two-story brick building, 30x125 ft. The main floor of the building is occupied by display rooms while the basement is a thoroughly equipped steam fitting shop. Since the death of Mr. Hays on Sept. 3, 1911, the business has been conducted by J. M. Eastman.

Decatur, Ill.—David Peters has opened a plumbing establishment in the 600 Block on East Wood street.

Marshalltown, Ia.—E. L. Toombs has sold his interest in the plumbing firm of Toombs & Downs, at 9 North First avenue. F. M. Downs will continue the business at the old stand with a new partner, W. W. Pyle, and the firm will in the future be known as the Marshalltown Plumbing & Heating Co.

NEWS FROM MILWAUKEE AND WISCONSIN.

Milwaukee.—Plans by Leenhouts & Guthrie, of this city, have been selected as the best for the Milwaukee county house of correction and the local firm will be awarded the first prize of $2,000 and will superintend the construction work. Twenty-one buildings, besides a set of cottages, will be erected and the plumbing and heating work will be extensive. Plans call for an administration building, two detention cell buildings, a refectory, a chapel, two cell houses for hardened criminals, two special buildings, residences for the inspector and the deputy inspector, two dormitories, four workshops, a laundry and powerhouse, and for the women's department, two buildings, one to provide for twenty-five inmates and the other for ten inmates. The plans now have to be accepted by the Wisconsin State Board of Control.

Milwaukee.—Grassler & Gezelschap have been awarded the contract for installing the heating and lighting in the new building of the Milwaukee School of Trades on Hanover street. The winning firm's bid was $6,574. Five other firms submitted bids.

Madison.—The Madison common council judiciary committee has voted to recommend the ordinance relating to the inspection of plumbing and to the creation of the office of plumbing inspector. The matter has been up for consideration for some time.

Watertown.—A. H. Kusel and O. Kusel have opened a new plumbing shop at 119 West Main street and will conduct the business under the firm name of Kusel & Kusel. Attention will be paid to both city and country plumbing work.

La Crosse.—James Smith has opened a new plumbing shop at 912 Caledonia street. Mr. Smith, a plumber of wide experience, has one of the most modern shops in the city.

Stevens Point.—C. E. Knapp, of Chicago, has purchased an interest in the Stevens Point Plumbing & Heating Co.

Waupaca.—Adolph Dahm has acquired additional office space with additional facilities for displaying his plumbing fixtures.

Antigo.—The Antigo Hardware Co. has purchased the business of the Antigo Plumbing Co. The new branch of the business will be under the direction of Louis S. Peters, formerly of Tisch & Peters.

Cumberland.—Victor H. Nedvidek and Hans Peters have formed a co-partnership and will open a new plumbing and heating business in the Comstock building.

Manitowoc.—William Karsten has anounced that he will erect a new and modern hotel, costing $30,000 to take the place of the old Erichsen house, recently destroyed by fire. Local plumbers are anticipating the securing of the contracts.

Fond du Lac.—Breyer Bros. Whiting & Co. have been incorporated with a capital stock of $25,000 to carry on a general plumbing business.

Rhinelander.—R. G. Lowell has secured the contract for installing the plumbing in the Soo line depot which is being erected here.

Sheboygan.—Louis Babich, connected at different times with several master plumbers here, has opened a new plumbing shop at 522 North Water street.

Marinette.—George C. Rathbun, city plumbing inspector, has announced that he will enforce the plumbing ordinances to the letter. After calling attention to the fact that in two instances at least, residents have sent to Chicago for plumbing fixtures and attempted to install them themselves, Mr. Rathbun says in part: "What is the result? Plumbing without traps or vents, poor material and very defective work. The ordinance governing plumbing provides for certain conditions, which a novice cannot understand, and in my official capacity I shall insist that all work along this line be done according to the ordinance. In the two instances cited there has been illness in both houses all winter, (due I believe to defective plumbing) and finally regular plumbers have been called in to do the work over and make it right. Are the residents anything ahead financially?"

NEWS FROM NEW ENGLAND.

Massachusetts.

Pittsfield.—James J. Sullivan, of the plumbing firm of Sullivan & Clancy, has purchased the Pixley property on Fen street. He plans to tear down the frame dwelling now standing on the property and to erect a three or four story brick block with stores on the ground floor and offices on the floors above. One of the stores will probably be occupied by the plumbing concern.

Marlboro.—George R. Wallace, for many years associated with G. R. Hall & Co., plumbers, has severed his connection with that firm and plans to open a plumbing establishment of his own.

Great Barrington.—Hammer Brothers have been awarded the contract to install a heating plant and do other work in the handsome new dwelling to be erected for F. P. Spath.

Abington.—The town has voted an appropriation for installing a heating plant in one of the town fire stations.

Newburyport.—The Hub Plumbing & Heating Co. was the only bidder for installing a supplementary heating system in the Kelley school-house and the contract will probably be awarded to this concern.

Revere.—The awarding of contracts for the erection, plumbing, heating and other work at the proposed new Central fire station has been held up because the lowest bids received are considerably in excess of the town's appropriation.

Bridgewater.—J. B. Rogers, who for forty-four years has been known as "the Broad street plumber," has sold his business to Edgar E. Cushman. Mr. Cushman takes possession on April 1st. Mr. Rogers came to Bridgewater in 1868 and after being in the employ of Charles Jewett for two years bought out the business which he has just disposed of. Although 75 years of age Mr. Rogers is in good health and has been able to attend to his work each day. Before going into the plumbing business Mr. Rogers followed the sea and he intends to spend the rest of his life in quiet and ease, occasionally spinning a yarn such as his friends are always ready to hear.

Maine.

Portland.—Harry E. Davis, Frank A. Davis and Harry A. Harmon have incorporated the H. E. Davis Co., to conduct a plumbing business. All are residents of Portland and well known to the trade.

Calais.—Edward Lambert has opened an up-to-date plumbing establishment.

Vermont.

Middlebury.—The contract for two large boilers to be used in connection with the central heating plant soon to be established at Middlebury college, has been placed with the D. M. Dillon Boiler Works, of Fitchburg, Mass.

Connecticut.

Torrington.—James J. Dwan has the contract for the plumbing, roofing and metal work for the alterations to be made in the Dwan Brothers block on Water street. The job is a large one.

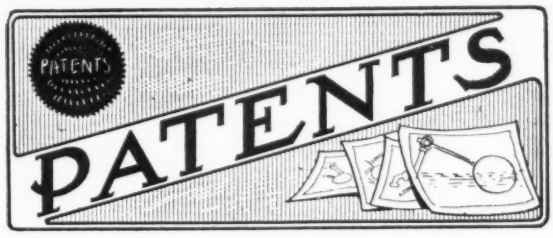
CONTRACTS RECENTLY AWARDED.

Anniston, Ala.—The Standard Plumbing & Heating Co. has secured the contract for the plumbing and heating of the new Agricultural school building which is to be erected at Albertville this spring.

Syracuse, N. Y.—Thomas E. Glidden, of this city, has been awarded the contract for the heating and ventilating of the State Capitol at Albany. The contract amounts to about $42,000.

Laborer: "And hav they tall buildings in America, Pat?"

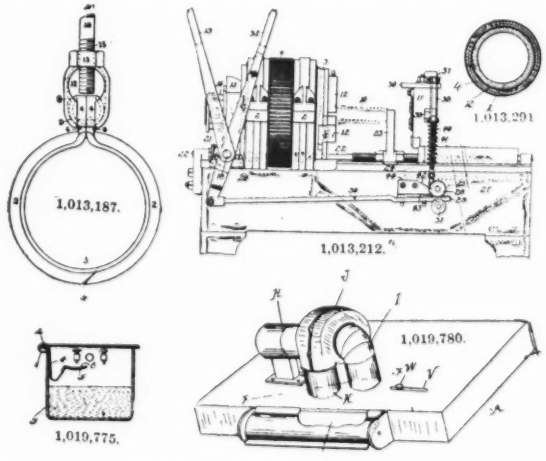
Pat: "Tall buildings have they—faith, Mike, the last one I worked on we had to lay on our stomachs to let the moon pass."—Life.



Heating Department.

1,013,187. Pipe-Hanger. Herbert M. Lofton and Edward E. Butler, Chattanooga, Tenn., and Rudolph M. Hunter, Philadelphia, Pa. A pipe hanger composed of a ring frame having a ball shaped head at its top and a short interposed neck portion of smaller cross section than the ball shaped part, combined with a suspension screw, and a socket portion secured to the screw and having an interior chamber of a cross section to freely receive the ball shaped head of the ring frame and a height greatly in excess of the height of the ball shaped head and said socket portion having an upper side opening of an area equal to the transverse sectional area of the ball shaped head and further having a vertical slotted portion opening from the said side opening and extending down to the bottom for receiving the neck portion of the hanger, the height of the interior chamber portion from the bottom to the large opening in the side thereof being greater than the length of the neck portion below the ball shaped head, the combination being such that the ball shaped head must be inserted through the large opening of the socket with the ring frame in a position substantially at right angles to the length of the socket and screw, then shifted downward within the socket away from the screw and with the neck portion received within the slotted part and then the ring frame and ball shaped upper part thereof rotated into a vertical position and so that the shortness of the neck portion prevents the upward rising of the ring part to permit accidental disengagement of the ball shaped part from the socket.

1,013,212. Pipe-Threading Machine. William M. Neckerman, Youngstown, O. In a pipe threading machine, a head having an axial opening therein, gripping-jaws on

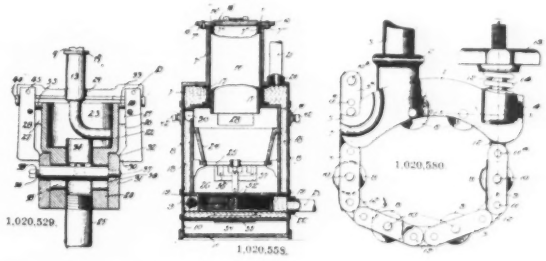


the head arranged to connect the pipe to the head, means for actuating the jaws, a die-head, a stop arranged to be moved into the path of the pipe when moving through the gripping head toward the die-head, and means connecting the stop to the jaw actuating means so that the stop will be moved out of line with the pipe when the jaws grip the pipe.

1,013,291. Method of Applying Pipe-Covering. Frank Mathanuel Gilmore, Chicago, Ill., assignor to H. W. Johns-Manville Co., a corporation of New York. The method of protecting underground metallic pipes from the chemical action of the surrounding earth which comprises the following steps; first, coating the pipes with hot asphaltum; second, saturating a strip of thick asbestos paper with hot asphaltum and applying same while the asphaltum is still soft to the pipe so as to completely envelop it; third, applying an outer coating of hot asphaltum.

1,019,775. Foot-Rest for Bath-Tubs. Frederick Forsberg, Chicago, Ill. A device of the character described comprising a body formed of a single piece of flat metal, one end of said body being formed to embrace the upper edge of a conventional bath tub, the lower end of said body depending into the interior and against the inner side thereof, said lower end of said body being turned upwardly and then outwardly terminating in an inwardly extending substantially horizontally disposed supporting portion, said supporting portion being slightly concave in form and a rubber covering for the upper edge of said supporting portion, substantially as described.

1,019,780. Ventilating Apparatus. Charles H. Gifford, Detroit, Mich., assignor to American Blower Co., Detroit, Mich., a corporation of Michigan. In a ventilating apparatus, the combination with an air box open at opposite ends, of power-operated air propelling mechanism mounted upon the box and having inlet and discharge ducts leading within its interior, and a slide within the box formed with adjoining and oppositely-extending bends adapted to register with the ducts.



1,020,529. Machine for Threading Pipe-Fittings. Charles Westen, Chicago, Ill., assignor to Northern Brass Manufacturing Company, Waukegan, Ill., a corporation of Illinois. In an automatic threading machine, the combination of a fixed body portion having an upper cup-shaped portion adapted to receive an L-shaped piece of work, a stem merging therefrom, arms carrying screw-threading dies pivotally mounted between lugs and radially extending from the cup-shaped portion, a spring bearing against said arms at a point below their pivotal center, whereby the dies are held normally outward from the center of the cup-shaped portion, said stem having a vertically extending bore therein communicating with the interior of the cup-shaped section at a point centrally thereof, said bore being of a reduced diameter from the chamber in the cup-shaped section, a plunger within the bore against which the work rests, said plunger extending when projected into the well and lying when fully depressed flush with the bottom of the well, whereby the bottom of the well forms a stop to limit the action of the dies on the work, a slidable collar surrounding the stem, a bevel face on the upper portion of the collar against which the arms carrying the threading dies normally rest, a cross pin fixedly secured to the slidable collar, the stem of said body portion having a slot formed therein in which said cross pin travels, a screw-threaded stem on the plunger entering the cross pin, a handle pivotally mounted on the collar for returning said collar to normal condition, said stem having a slot in which the inner end of the handle lies, substantially as described.

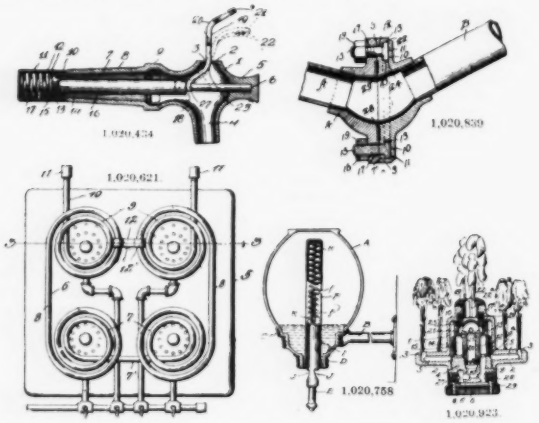
1,020,558. Water-Heater. Frederick C. Jaeneke, Milwaukee, Wis. A water-heater having a smoke-trunk therein below the ashpit thereof in communication with a base-compartment that is open to a draft-flue, there being ducts leading from the fire-chamber of the heater to the smoke-trunk, and water circulating space above said fire-chamber, around the same and said ashpit, and about said smoke-trunk.

1,020,580. Pipe-Cutter. James R. Smith, Mechanicsville, N. Y. In a pipe cutter, the combination with a head and handle, said head having a bifurcated part, of a chain of cutters, the links of which are adapted for reception in the

bifurcated part and have projections adapted to be engaged with the head at the bifurcated part thereof, thus permitting quick attachment thereto or detachment therefrom, a screw-threaded bolt connected to the other end of the series of cutters and passing loosely through the head, an adjusting nut or wheel engaged with the screw threads on said bolt, and a coil spring interposed between the nut or wheel and the head, the bolt permanently connecting the cutters to the head, the series of cutters being adapted to be quickly opened out to surround the pipe and substantially initially adjusted and thereafter brought into firm contact with the pipe by turning the nut or hand wheel.

Plumbing Department.

1,020,434. Faucet. John A. McKenna, Crafton, Pa. The combination with a faucet having a valve seat and a reciprocating valve and valve stem spring-supported to normally retain the valve on its seat, the valve body having an opening, said steam having a shoulder inwardly of and facing said opening, of a key insertible through said opening and adapted to engage said shoulder, the inner end of said key being bifurcated, the legs provided by said bifurcation being adapted to straddle the stem and being curved in the direction of length of the key on an arc which will place the point of contact of key and shoulder on approximately diametrically opposite sides of the stem and intermediate the ends of the curved face of the legs when the valve is closed, said curved face of the legs riding over said shoulder and applying valve-opening pressure to said shoulder during the inward movement of the key, the point of pressure application remaining substantially the same during such valve movement, whereby lateral pressure on the valve stem is avoided.



1,020,839. Universal Pipe-Coupling. Michael H. Niesen and Hubert Niesen, Kaukauna, Wis. A pipe coupling comprising relatively adjustable contacting members each provided with a socket portion, the contacting portion of one member having a groove therein, the contacting portion of the other member having a passage therein, the groove being formed to provide spaced shoulders, and a clamping bolt having a head portion mounted in the groove and having a shank portion extending through the passage, a part of the opposite lateral edges of the said head portion being curved to provide inner and outer concaved and convexed surfaces respectively, contacting with the corresponding walls of the groove, the said head being further provided with curved surfaces which are arranged in opposite relation with respect to the shoulders.

1,020,621. Water-Heater. Belle Reid, St. Louis, Mo. The herein described water heater comprising a pipe bent to form a parallel inlet and outlet end portions, a pair of end coils and a pair of intermediate coils, each of said coils being spiral, the said end portions of the pipe being connected to the smallest convolutions of the end coils and passing under the large convolutions thereof, said pipe having parallel connecting portions between the largest convolutions of the end and intermediate coils and a connecting portion between the smallest convolutions of the intermediate coils and passing under the larger convolutions thereof.

1,020,758. Liquid-Soap Fountain. Newton S. Hillyard, St. Joseph, Mo. In a liquid soap fountain the combination with a supporting bracket, of a fountain having a threaded portion to engage with said bracket and a lower threaded portion at its base, an elongated vertical conductor open at its base and provided with vertical slots, a cross slot and a perforation, a spiral spring in said conductor, a threaded cap integral with the base of said conductor engaging with the lower threaded portion of the base of said fountain, a piston having incuts of different sizes forming recesses, a pin rigid therein and revoluble with said piston through said cross slot, said recesses being adapted to receive liquid soap from the fountain through said perforation when the piston is elevated and a recess engages therewith and to discharge said soap when said piston is driven down by the spiral spring and a recess is below said cap.

1,020,923. Sanitary Drinking-Fountain. Philip Mueller and Anton C. Schuermann, Decatur, Ill., assignors to The H. Mueller Manufacturing Company, Decatur, Ill., a corporation of Illinois. A drinking fountain comprising a nozzle having a hollow body with a plurality of radial tubular fingers, an upwardly directed opening in each finger, at its outer end, a nipple having an outlet for a drinking stream extending downwardly through an opening in the upper end of said body, a bushing extending upwardly into said body and connected thereto, said bushing having passageways therein for water, and means connecting said bushing and nipple through which means water passes from one of said passageways to the outlet of the nipple, and from the other passageway around said connecting means to the tubular fingers where it flows through their terminal openings in streams above said nipple to form a curtain for the same.

KANSAS CITY, MO., TO BUILD PUBLIC COMFORT STATION.

The board of public works at Kansas City, Mo., will soon advertise for bids for the construction of a public comfort station, plans for the station having been approved by the board at a meeting held last week.

The comfort station will be built under Ninth street, between Main and Walnut streets. The two entrances, one on each side of Ninth street, will be but a few feet east of Main street. This location was selected because of the steep grade of the street and because Ninth street is little used for traffic.

The entrances will be next to the curbing at each side. The stairways leading to the station will be five feet wide, guarded by ornamental railings with an ornamental light on the street level. The north side will be for men and the south side for women. A rest room will be a part of the women's compartment. Shoe shining concessions will be let in both. The fixtures will be up-to-date, of the latest design, with sanitary plumbing.

The walls of the station will be of white glazed tile, the floors of terazzo. Supply closets will insure clean towels and soap at all times. The estimated cost of the station is $20,000.

"Kansas City has long been in need of such improvements," William Buchholz, president of the board of public works, said this week. "Other cities of this size have spent large sums of money in the building of these stations, but Kansas City has neglected such improvements."

To Have—Not to Hold.

"Married, old chap?"

"No; I cawn't affawd t' keep a wife."

"Aw, but, I say, what with Reno and all that, one isn't obliged to."—Youngstown Telegram.

Our cemeteries are full of people who thought they could cross the track ahead of a train.—Judge.

"The Hague has done much toward promoting the peace of the world." "Yes," replied Miss Cheyenne, "and so has Reno."—Washington Star.

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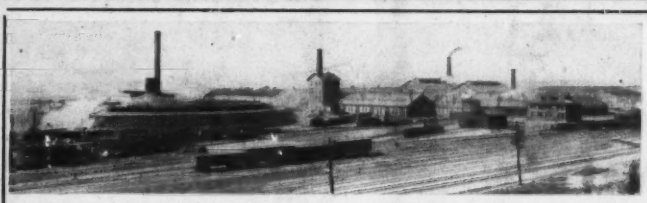

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4,935 feet above sea level—

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In All Classes of Buildings in All Climates
wherever efficiency counts and where economy is a factor for consideration, the
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SYSTEM OF VACUUM HEATING

Will be found—Read our Catalogue, study the list of installations, recommend and specify it. Remember our engineering dep't is behind you and back of that is the company itself with an iron clad guarantee and a reputation for years of fair dealing and integrity.

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We manufacture and sell 125,000
(one hundred and twenty-five thousand)

4 1-2 Fuller Bath Cocks

per annum, for the wholesale trade only. You lose, if you don't inquire.

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This Valve Can Be Used

in connection with any Vacuum, Drip Pipe or Air Line System.

The Automatic Heating Co., owners of the Paul System, say that our "Telwen" Valve is a decided advance over any they have heretofore used.

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NONE BETTER MADE
"Richter Queen City" Compression Work
THE LOGICAL KIND
Write for new descriptive catalogue.
THE RICHTER CO., Cincinnati, O.

MUELLER SEE PAGE SIX

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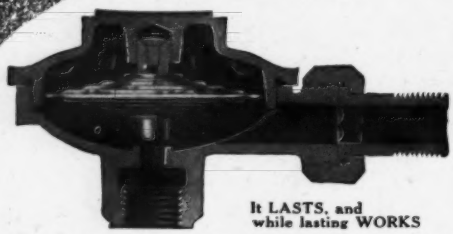
The DUNHAM Trap
has one moving part



It LASTS, and while lasting WORKS

It positively frees the radiator of all water and air without the loss of steam. Does not clog up. Note the simplicity.

Would you like to learn more of this little trap which will positively increase your profits? Ask us for references in your section, or if you know where a **Dunham** System is installed, investigate it.

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C. A. DUNHAM CO., Marshalltown, Iowa

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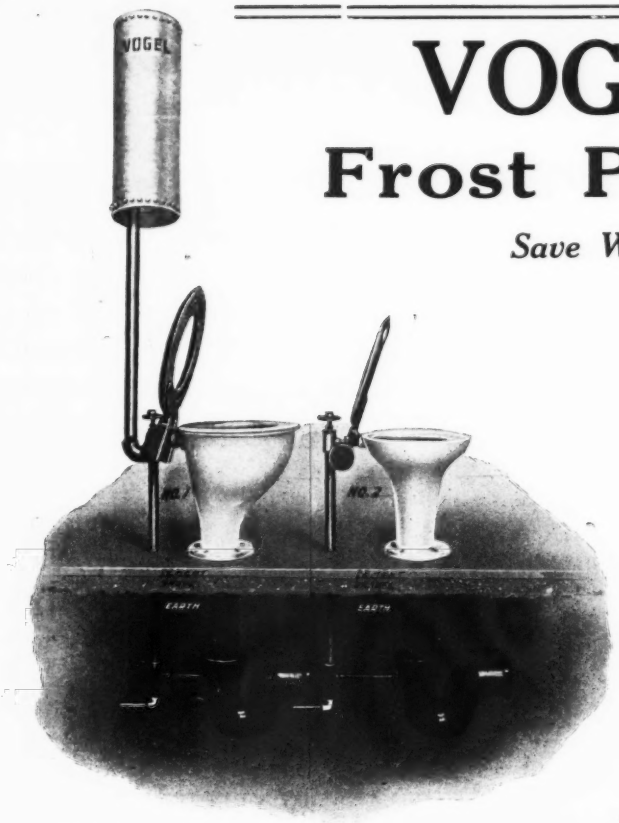

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They are simply and durably constructed and have a very neat appearance.

Absolutely frost-proof when properly installed.

Many thousands of these closets have been sold throughout the country and are giving satisfaction.

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Hot Water and Steam

Are the product of fifty years' experience in the manufacture of steam and hot water heating boilers. They embody every improvement of value, are constructed from highest grade irons, by skilled workmen, and their use will give both the contractor and user the greatest satisfaction. We sell only through the trade. Be sure you have our catalogue and quotations.

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Every article of merit you can carry as a side-line will greatly increase your profits without any additional expense.

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will sell readily among hotels, restaurants, offices, buffets, banks, etc., because of its special foot-flushing device and its many other distinguishing features.

Send for a full description and our special offer.

McDERMONT & MORY
25 W. 2nd Street DAYTON, O.

MORGAN-CLARK VACUUM VALVE and FLUSHING SYSTEM

Overcomes all undesirable and unreliable features.

We Can Prove It

Send for Booklet and be convinced.

Morgan-Clark System Co.
380 Exchange St.
Rochester, New York

A poor workman finds fault with his tools.

A good workman doesn't.

A good workman provides himself with good tools.

Are you equipped with a "Leucit" Gasoline Torch?

This Torch melts a one-inch copper rod in 5½ minutes. It will braze copper tubes of 300 mms. diameter and 3 mms. thickness of metal. It is largely employed in coppersmiths' and engineering works, in distilleries, sugar mills, etc. Its great efficiency characterizes the "Barthel" line. Look for the name "G. Barthel" on the furnaces and torches you buy. Let your request for folder get out in today's mail.

Globe Gas Light Co.
25-27 Union Street
BOSTON, MASS.

"Wyco Finish" Stays White

A transparent, sanitary white finish for seats, tanks, mirror frames, metal work and all bath room fittings.

Stays White under all tests required of it. Non-porous. Can be washed with hot or cold water.

Guaranteed. Write us about it today.

Wyman & Company
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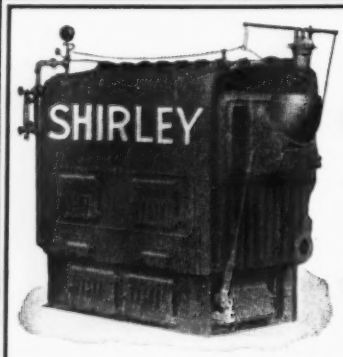
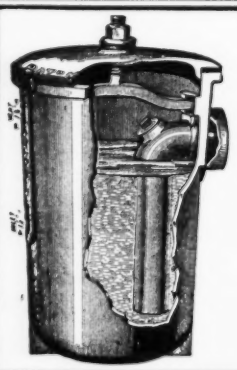


Shirley Radiator & Foundry Co.,
Shirley, :: Ind.
Will Rebuild at Once



Boston Grease Trap

Easily cleaned, thoroughly reliable trap for kitchen sinks, etc. Simple and effective. Preferred by leading plumbers.

Send for discount.

R. Estabrook's Sons
1st and C Sts., So. Boston, Mass.

ALL PLUMBERS AND FITTERS HAVE VISES

But All of Them have not found out that the

Parker Combination Vise

is the best on the market. Six sizes and every one O.K. Sold by all jobbers.

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FACTORIES:
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THE FROST MFG. CO.

Closet Fittings
"Femco" Traps
"Femco" Bath Wastes

KENOSHA, WIS.

A Trade-Mark is a valuable asset; but a Trade-Mark is not very valuable if it doesn't stand for tangible value. Back of our Trade-Mark is one of the oldest and best equipped factories for the manufacture of STOCKS and DIES and Steam, Water and Gas Fitters' Tools that have no superior anywhere, and a fixed policy of honesty and fair dealing.

There can be but one result, a high grade product and consequently satisfied customers. The plant that stands back of our goods is your guarantee.

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THE ARMSTRONG MFG. CO., 284 Knowlton St.

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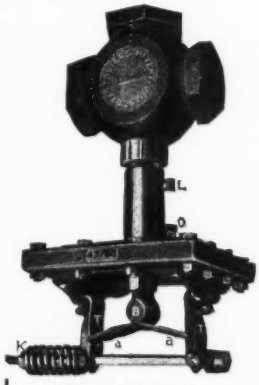
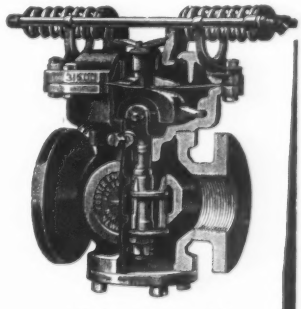


"Class Q" Valve

Foster Valves



Foster Class "W"

"Reliability Their Main Feature"

All is not well unless it ends well.

Have you had any come backs this spring on your steam heating jobs?—Valve troubles only, eh?

You will be plugging right along on the "It's never too late to mend principle" with a good sized hole in your profit at that rate.

You can easily cut that kind of thing out and it's up to you to do it—dependable valves are all you need and you can find none more so for low pressure service than

Foster Class Q or QH Valve

Each is intended for from one to fifteen lbs. delivery—Class "Q" has equal sized inlet and outlet, Class QH has large outlet, which permits a smaller valve to be used than delivery pipe calls for, this means just as good service at less valve cost. If it is a question of high pressure reduction

Foster Class "W" Valve

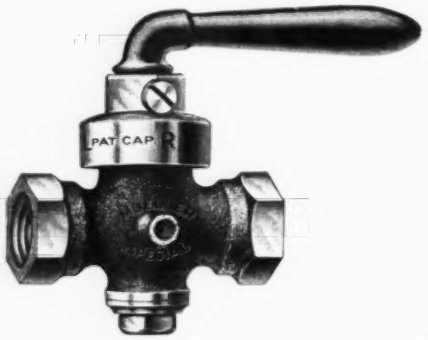
is the right valve for the job—sizes to suit—satisfaction is sure and prices pleasing.

Send for Foster Catalog — New Edition

FOSTER ENGINEERING COMPANY **Newark, N. J.**

BOSTON, MASS., 161 Summer St.
PHILADELPHIA, PA., 601 Harrison Bldg.
PITTSBURGH, PA., 914 Farmers Bank Building
CHICAGO, ILL., Room 520, 180 N. Dearborn Street

No. 49 Mueller
Stop and Waste Cock



D-6514

Good Friends and True
Who Will Stick By You

That's the Mueller line of Stop and Waste cocks. They are friends of yours on a job because they will uphold your reputation for doing good work and return good service to your client.

The No. 49 Stop and Waste cock is the most popular and most used on the market, because plumbers have found that it comes right up to the scratch.

All Mueller Ground Key work is tested under two hundred pounds hydraulic pressure and Unconditionally Guaranteed.

"There's Lasting Class in Mueller Brass"

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REGISTERED

H. MUELLER MFG. CO.

Works and General Offices
DECATUR, ILL., U.S.A.
West Cerro Gordo St.

Eastern Division
NEW YORK, N.Y., U.S.A.
254 Canal St., Cor. Lawrence

The Williamsport Line

The cut shown herewith illustrates our new 22-inch **Push Nipple Boiler,** with ratings of 600 feet to 1400 feet steam and 1000 feet to 2400 feet hot water. For lower capacities there is our 15-inch **Push Nipple Boiler.**

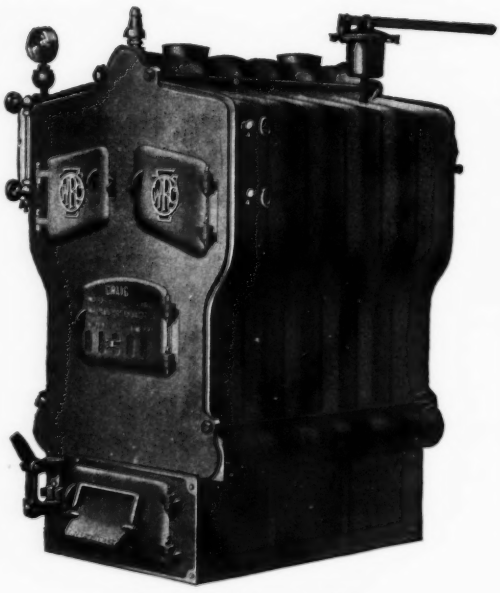
We also manufacture the well known line of **Craig Screw Nipple Boilers** in all capacities.

Ask us for new Catalogue and discounts to the trade.

Architects—See Sweet's Index.

Williamsport Radiator Company
WILLIAMSPORT, PA.

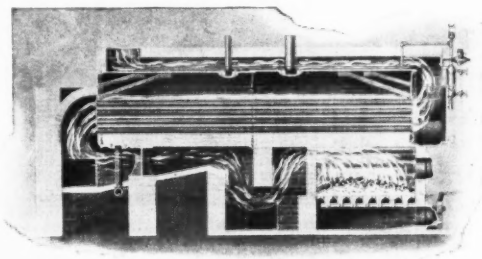
99 Beekman St., NEW YORK
1415 Commonwealth Bldg., PHILADELPHIA, PA.



No. 226 Steam Boiler

BURNS SMOKE

Complies With Ordinances of All Large Cities



"B Series" Detachable Firebox Boiler With Smoke Destroying Arch

Durable - economical - efficient

Made in sizes from 500 feet to 25,000 feet steam—proportionate sizes for water.

Investigate this wonderful Boiler now — Low price — Profit-getter

Herbert Boiler Company

Root and LaSalle Sts. CHICAGO

The Nye Pipe Cutter

No. 1 Cuts 1-8 to 1 1-4 Inch Pipe

No. 2 Cuts 1-2 to 2 Inch Pipe

and is tapped in the bottom of the cutter frame for ½ inch pipe, thus allowing the use of an extra handle which is furnished with the tool. But little mental effort is required to figure the difference in utility between a single and a two handled pipe cutter. In one instance the leverage is divided evenly and continuously between both hands in the other, waste of action and energy results from the necessity of reaching over, under and around with each turn of the cutter

The Exceptionally Large

cutter wheel in this tool is made from high grade tool steel, tempered by a process that imparts a wear-defying hardness. It cuts with marvelous ease, leaving a scarcely perceptible burr. The rollers greatly exceed in size and bearing those common to most pipe cutters. The cutter wheel has the same width of bearing. Bearing pins are made of the best tool steel.

"NYE, THE DIE MAN"

The Nye Tool & Machine Works

114 N. Jefferson St. - CHICAGO, ILL.

The Mechanical Rubber Co

Did You See The Last "Nagrom" Ad.?

Here it bobs up again because you can't down a thing of merit. The *"Nagrom" Tank Ball* is an improvement. The soft bottom conforms perfectly to the seat while the harder top maintains the shape and prevents collapse. The "Nagrom" is right—Why consider the unknown?

Manufactured by

The Mechanical Rubber Co., Cleveland, O.

Kindly quote "Domestic Engineering" in writing advertisers.

A-161 "BERNICE" LAVATORY

Slab	24x34 inch
Basin	14x18 inch
Apron	5 inch

KOHLER

Porcelain Enameled Iron Sanitary Plumbers' Ware

"A-GUARANTEE OF QUALITY" TRADE MARK

Meets the approval of the architect, the dealer, the builder, because of

ITS ARTISTIC DESIGNS
ITS DURABILITY
ITS GLOSSY WHITE FINISH

These are features that make ***Kohler Ware*** unsurpassed in quality.

We produce only high grade ware and aim to serve every customer with the utmost degree of promptness.

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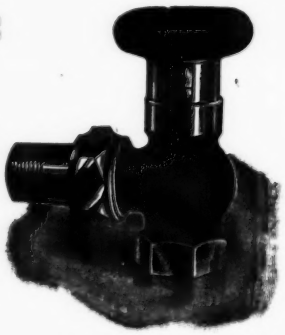
ATMOSPHERIC SYSTEM OF STEAM HEATING

is based on the correct principle. Steam is supplied in vapor form from the ordinary house boiler or from the central station.

Actual practice has demonstrated this system will save from 25 to 40 per cent in fuel bills. Furthermore it is easier to control and maintain, and is the ideal system for use in residences, public buildings churches, office buildings, schools, etc.

Naturally you are interested so write for catalog No. 119 giving full information. Estimates furnished.



"ADSCO" Graduated Radiator Valve

Our "ADSCO" valves are graduated to supply any given amount of radiation and may be regulated to suit weather conditions.

American District Steam Co.

Lockport, N. Y. North Tonawanda, N. Y. Chicago

Kindly quote "Domestic Engineering" in writing advertisers.

Trimo Tools are the Mechanic's Best Asset on a Tough Job

TRIMO PIPE WRENCH

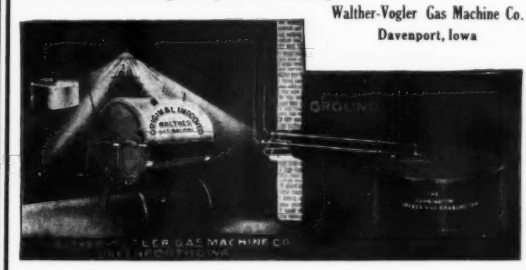
TRIMO PIPE CUTTER

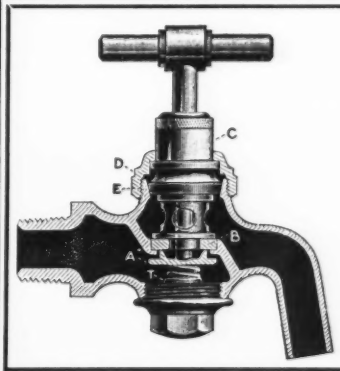
Time Is Money and Good Tools Save Time. Then why save *a Quarter on a Tool* and lose *Ten Dollars' Worth of Time* over a rusty pipe? Pay the difference and secure the best. *Send for Catalog No. 42*

TRIMONT MANUFACTURING CO. 55-71 AMORY STREET Roxbury (Boston), Massachusetts

Wake Up! Watch for the sale and installation of the **O. W. I. Gas Machine.** The gas and light of the age, for country homes. Big profits for the plumber. If you have not our catalogue, a postal will bring it.

Walther-Vogler Gas Machine Co.
Davenport, Iowa





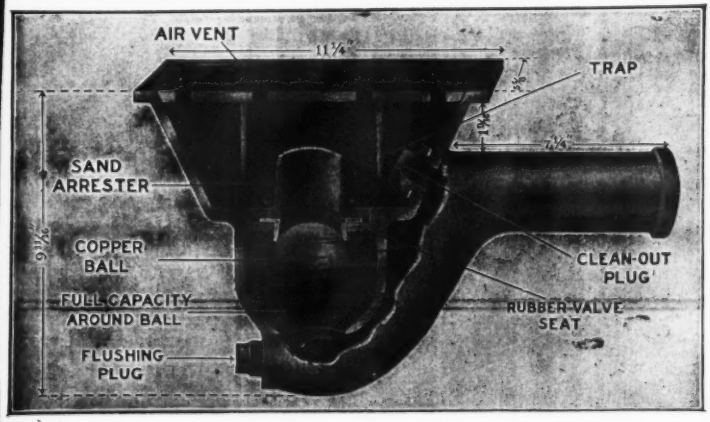
→WITH *not* **AGAINST←**

Bashlin Faucets close **with** the pressure—not **against** it. Hence neither strong springs are needed to close them, nor strong hands to open them. Send a trial order. You'll ask a "second helping."

The Bashlin Co.
WARREN, PA.

The best floor drain on earth

The BLAKE Jr.



No-Back Floor-Drain

Patented July 11, 1911

This cut gives the measurements of our two-inch drain. Other sizes are in same proportion

2-in. measures 11¼ x 11¼ and 9⅛ in. deep; weight 35 lbs.
3-in. measures 12 x 12 and 12⅛ in. deep; weight 45 lbs.
4-in. measures 17 x 17 and 16 in. deep; weight 85 lbs.

Is built along the most advanced lines—sanitary, durable, practical.

You will be convinced by the above illustration that our claim, based on years of experience, is right.

We manufacture cleanouts, running back water traps, water-pressure dirt-augers, iron, lead and brass traps fitted with Blake's "so-easy-to-remove" clean-out covers, boiler-fittings, adjustable boiler-stands, test-tees, test-plugs, iron and brass ferrules, closet-bends, closet-waste fittings, etc.

Write for descriptive literature.

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Main Office and Factory:
1600 Mill St., Rock Island, Ill.

New York Office:
34 West 33d St.

SURROUNDED BY GOOD TOOLS

YOUR WORKMEN CAN install your jobs at 30 per cent less cost than if they are supplied with indifferent ones.

Your labor will cost you plenty as it is; don't diminish its efficiency by supplying poor tools.

Write today for our special catalog on plumber's calking tools.

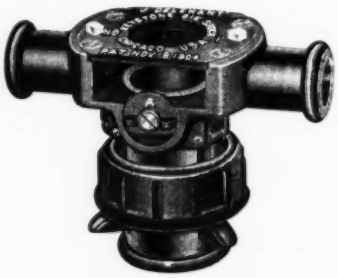
GOOD TOOLS PAY DIVIDENDS

Don't forget. Write now

W. H. ANDERSON
Tool & Supply Co.
14-16 Macomb St.
DETROIT, MICH.

J. J. Delehant's

Keystone Die Stocks
and Pipe Reamers

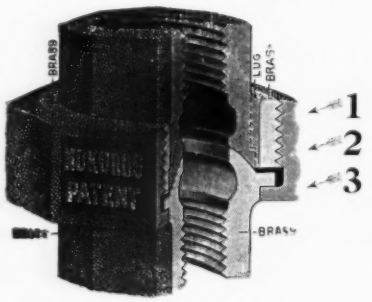


Of interest to pipe fitters. A Die Stock that will cut a straight and perfect thread. The illustration is a side view showing the opening where the die is placed in position.

A complete description of Keystone Die Stocks will be sent on request. Send for it today.

Keystone Die Stock Co.
652 W. 47th St., Chicago.

THREE CONTACT POINTS



are non-corrosive—Brass to Iron—in

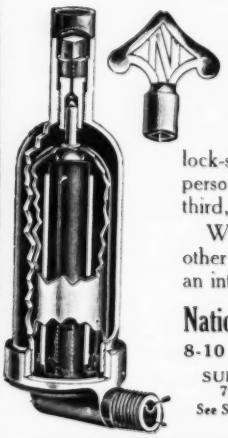
The Nokoros Patent Union
Perfection Attained

Ask Your Jobber

Illinois Malleable Iron Co.
CHICAGO

NATIONAL VALVES MEAN HIGH EFFICIENCY

Here's the "Fool-Proof" Valve!!



The National No. 5 is "fool-proof" for three reasons: First, the composition cannot buckle or bend because it's protected by a brass casing; secondly, the lock-shield prevents unauthorized persons tampering with the valve; third, it has a separate air passage.

Write for information on our other valves—and for particulars of an interesting offer to dealers.

National Steam Specialty Co.
8-10 S. Clinton Street Chicago
SURPLESS, DUNN & COMPANY,
74 Murray St., New York City
See Sweet's Index, Pages 1139, 1140, 1141

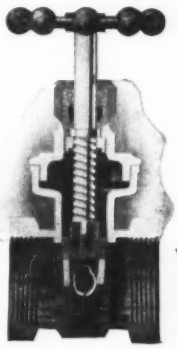
SOMETHING ENTIRELY NEW IN

SILL-COCKS

Semi-Finished, Polished aluminum wheel Style N. Style O---Heavy rough pattern built for service.

STYLE N — Both shown in Catalog D. — STYLE O

KINSEY & MAHLER CO. *PEORIA, ILL.*



1236 Kinds and Sizes of Detroit Radiator Valves

Because no **one** radiator valve can be made to give proper service under **all** conditions, you will find in the Detroit line a valve for **every** condition.

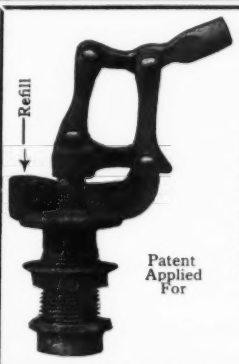
You will find a Detroit Radiator Valve **exactly** suited to your requirements.

Every Detroit Valve is the product of scientific study of the service for which it is designed.

Everywhere Detroit Valves are proving every day that each one is the right one for its particular place.

The Detroit catalog tells all about them. Write for catalog A-36.

DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.
Largest manufacturers of radiator valves in the world



THE PARKINSON BALL-COCK

is simple, strong and durable. It has only three working parts and one packer, and it can be repacked in a few minutes by removing two cotter pins. It has a bushing for high pressure, and it has no enclosed chambers to corrode. Sand or muddy water will not affect it at all. These and other superior features are making it a favorite with contracting plumbers.

Write for full particulars today.

The Parkinson Mfg. Co.
Ashland, O.

No. 6 Perfecto

Automatic Air Valve

Five Years at Hard Labor

The Edelmann No. 6 Perfecto Air is Guaranteed to *Work* for 5 Years

And because it can give this service it is more to be desired than a cheap valve. Send today, while the sending is good, for our valve circular.

E. EDELMANN & CO.
47 W. Kinzie St., CHICAGO

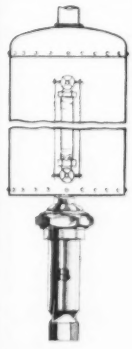
"DIAMOND N"
Air Cell Covering

For High and Low Pressure, Hot Water Work, Etc.

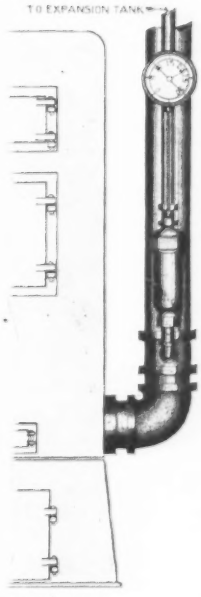
This is a thoroughly fire proof and almost indestructible covering. It is a recognized non-conductor. Is full quarter-inch to the ply and has small corrugations, leaving little space for confined air. Will not "pinch down" in working. Is light and easily applied.

Write for Estimates

Norristown Magnesia & Asbestos Co.
NORRISTOWN, PA.



2 Ways To Connect B



Heat Intensifiers

It costs nothing to connect if done when work is being installed.

Packed in corrugated paper boxes.
Size, 3½ x 2½ x 8. Weight, 3 lbs.
Shipped in original packages. The most compact appliance made.

Bottum Valve Company
(Not Inc.)
162 N. Dearborn Street, Chicago

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The "B. & C." Combination Floor and Ceiling Plates

No. 3

No. 3 Style with Set Screw.

Made in sizes from ¼ in. to 10 in.

Black, Nickel Plate and Brass.

Snap-Locked Cold Rolled Steel, Non-Brittle, Un-Breakable Light in Shipping

No. 9 "Wells"

Hand-somely Nickel-Plated In sizes ½ in. to 3 in.

Springs allow for expansion and take up contraction.

Sizes ⅜ in. to 3 in.

Black and Nickel-Plate.

No. 7

The most easily adjusted and the only genuine B. & C. Plates on the market

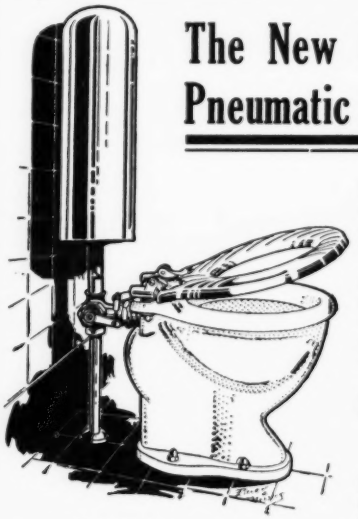
Manufactured exclusively by

THE BEATON & CORBIN MFG. CO.

SOUTHINGTON, CONN., U. S. A.

The Old Original Company N. Y. Office: 210 Water St.

The New Century Pneumatic Flusher



Is automatic and is designed to meet all requirements.

Can be attached to any service line, Bowl and Seat now in use. The

New Century Flusher

will meet all conditions of water, absolutely NOISELESS, and is guaranteed for three years. We furnish the New Century Flusher with or without the bowl and seat. Order today on a thirty-day trial. It will save you money, noise and trouble.

Write Your Jobber for Prices, Etc.

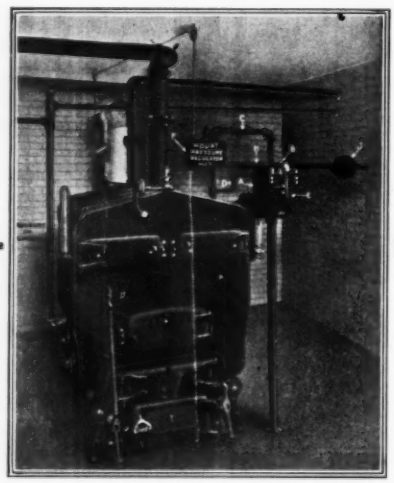
H. C. Bowlus Mfg. Co.

16 North Limestone St., Springfield, Ohio

THE MOUAT VAPOR HEATING SYSTEM

(PATENTED)

Simple



Economical

The main feature of the MOUAT Vapor Heating System is the ability to control the heat to suit weather conditions. Each radiator is equipped with a fractional valve and may be **kept partially** or entirely heated as required.

WRITE FOR OUR PROPOSITION

MOUAT VAPOR HEATING CO.

1246-54 W. 4th St., Cleveland, O.

Builders Bond Company

CAPITAL, $200,000.00

La Salle Street National Bank Rooms

ROOKERY BUILDING

Cor. La Salle and Adams Streets

CHICAGO

Phone, Wabash 2112

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8. Finance building contracts; act as financial agents.
9. Provide, AT OUR EXPENSE, a corps of competent lawyers and experienced investigators for every legal need and emergency of patrons.
10. Secure collections without lawsuits or loss of time.

Oldest Range Boiler Manufacturers in the World

Boilers That Will Not Leak

Every part is of good material and all seams absolutely tight.

Not One Rivet in the Boiler

We make them of any size. Tested to any pressure. Tapped as you desire.

EVERY TANK GUARANTEED

WM. B. SCAIFE & SONS CO.

Founded 1802 PITTSBURGH, PA.

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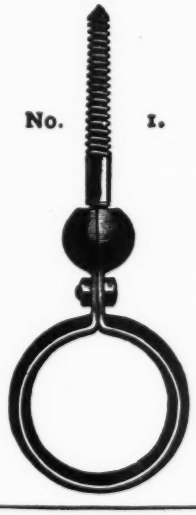
The Hanna "Ball Joint" Pipe Hanger

SIMPLEST



No. 1.

STRONGEST

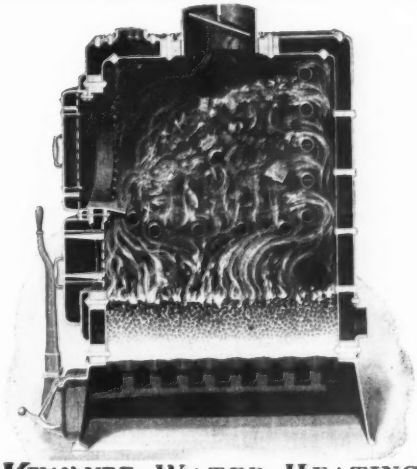
The only thoroughly reliable hanger on the market. **Neat, Symmetrical.** Guaranteed to be the strongest hanger made. The ball and socket joint allows hanger to swing in any direction. Pipe may be lowered or raised without removing hanger. No loose parts to drop off or get lost.

We also make "Penn" and "Ball Joint" Steam and Water Specialties

Write for our "Silent Salesman"

The Penn Engineering Co.

Philadelphia, Pa.



KEWANEE WATER HEATING GARBAGE BURNER

For Destroying Refuse Without Odor

Burns ALL the Garbage
Destroys ALL the Odor
Heats ALL the Water you can use.

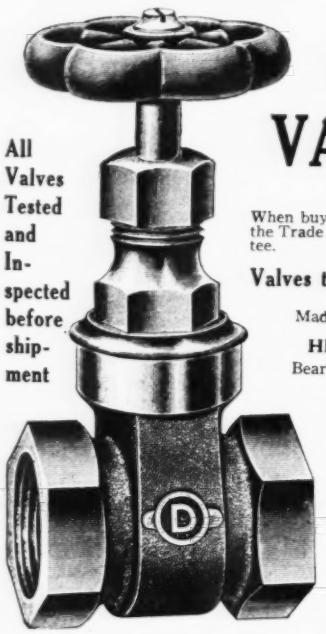
PATENTED
Send for catalog No. 59

KEWANEE BOILER COMPANY

KEWANEE, ILLINOIS

Chicago St. Louis New York Kansas City Salt Lake City

"HIGH GRADE GOODS"—"MODERATE PRICES"



GATE VALVES

All Valves Tested and Inspected before shipment

When buying Valves look for the Trade Marks that guarantee.

Valves that Don't Leak

Made in Two Grades

HIGH GRADE
Bear this Trade Mark

Medium Pressure
are identified by this Trade Mark

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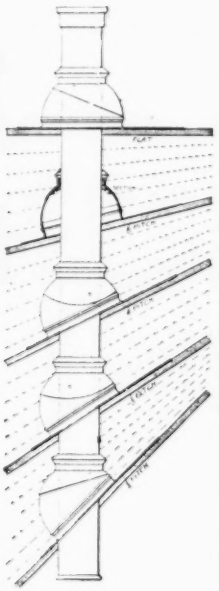
DETROIT BRASS WORKS
DETROIT, - - - - - MICHIGAN

WHY NOT USE THE BEST?

IT'S

The Bullard Roof Flange



Adjustable to all Pitches.

Fits either Standard or Extra Heavy Soil Pipe.

Easily attached.

Always ready for use.

Rust-proof and non-leakable.

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THE BULLARD SPECIALTY CO.
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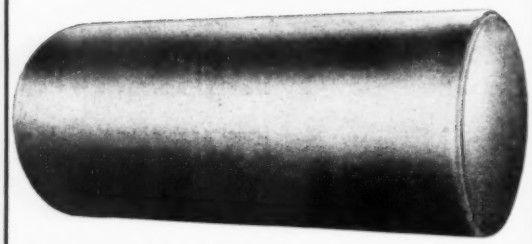
Air-Tight Steel Tanks for Compressed Air and Water Systems

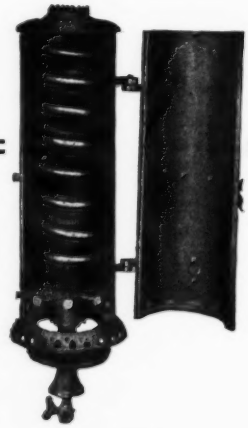
Every Tank Guaranteed Not to Leak Under Pressure Specified.
Our Capacity is Sufficient for Your Requirements.



The seams and heads in AIR-TIGHT Tanks are brazed, making the tank one solid piece of steel, with the joined parts the strongest. There is no caulking with the "air-tight" as with a riveted tank. We have been building these tanks for over 20 years and have never had one returned under this guarantee. It's just as easy to buy the best tank that WILL do your work as one that MAY do it.

Write For Price List.

Air-Tight Steel Tank Company,
MANSION AND GLOSTER STREETS
Pittsburgh, Pa.



Lawson Gas Water Heater

No. 22

A double coil heater that does the work every time. Put it on a 30 or 40 gallon boiler and see how quick you've got hot water.

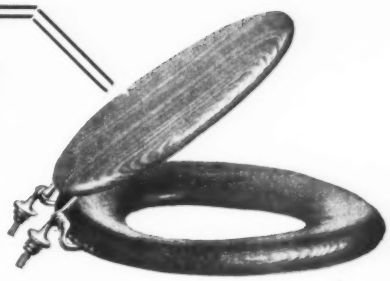
Here's a heater that will make you a reputation and a lot of money too. Send your order now for a sample and get a supply of advertising matter—good stuff that'll stir things up.

Write for complete catalog and prices.

LAWSON MANUFACTURING CO.
Homestead, Pa.

Kindly quote "Domestic Engineering" in writing advertisers.

Don't Use Trouble-Making Wooden Seats



You know that wooden seats are made in many pieces and glued, bolted or wired together—that they are constantly warping, opening up and falling to pieces. Wood is porous and absorbs moisture and foul odors, so can never be made sanitary.

Besides, wooden seats swell and throw fittings out of adjustment.

J-M SANITOR SEATS

eliminate all these troubles because they are moulded in one solid mass from specially treated wood fibre. They are absolutely unaffected by moisture, so cannot swell, warp or fall apart like wood.

They are non-absorbent, therefore do not harbor germs or vermin, so cannot spread disease. *Are absolutely sanitary.* They are finished equal to wood and have a lustre that is far more lasting.

In some places seats made of this material have been in continuous service from 16 to 20 years and are practically as good as new.

Write nearest branch for booklet and sample of Sanitor material.

H. W. JOHNS-MANVILLE CO.

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ASBESTOS ROOFINGS, PACKINGS, ELECTRICAL SUPPLIES, ETC.

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PRATT & CADY CO.

HARTFORD, CONN.

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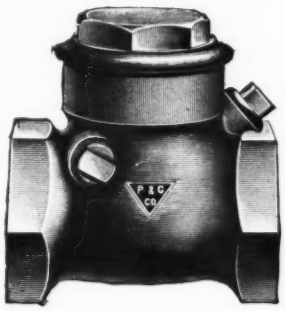
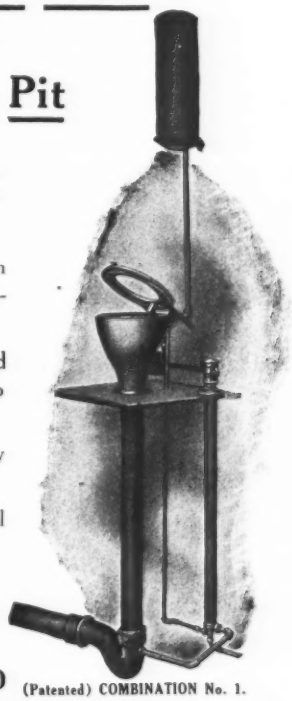


Many imitate us, but none can compete with the celebrated

P. & C. SWING CHECK VALVES

Always specified by architects.
We solicit your orders DIRECT

"HAAS" Frost-Proof Water-Closet Requires No Pit



Here's a frost-proof Closet that's absolutely reliable and practically everlasting.

Very simple in construction and **very** easy to install---look at the illustration.

The flush is prompt and powerful, and cannot fail to operate perfectly.

Our goods are handled by all Jobbers.

Write at once for special literature and details.

PHILIP HAAS Co.

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DAYTON OHIO

(Patented) COMBINATION No. 1.

Kindly quote "Domestic Engineering" in writing advertisers.

SMOOTH-ON

IRON CEMENTS

Positively stop all leaks of steam, water, fire or oil. They are easy to apply, harden quickly and when hard, expand and contract with the iron.

Every engineer and plumber should have a copy of our instruction book.

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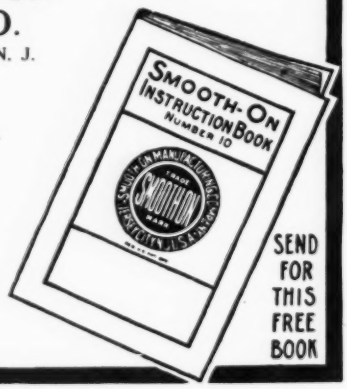

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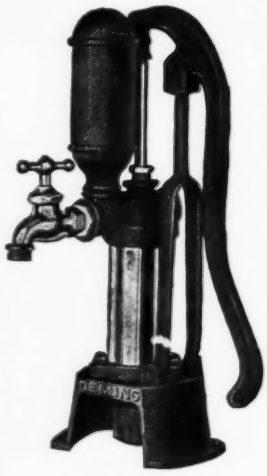

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With Brass Cylinder

Write for Our Complete Catalogue

The Deming Company

SALEM, OHIO

Hand and Power Pumps for All Uses

GENERAL AGENCIES:

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What Kind

CAN YOU SELL?

We Make

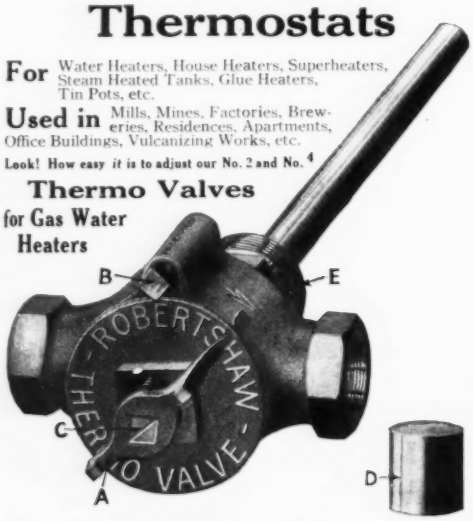
Thermostats

For Water Heaters, House Heaters, Superheaters, Steam Heated Tanks, Glue Heaters, Tin Pots, etc.

Used in Mills, Mines, Factories, Breweries, Residences, Apartments, Office Buildings, Vulcanizing Works, etc.

Look! How easy it is to adjust our No. 2 and No. 4

Thermo Valves for Gas Water Heaters



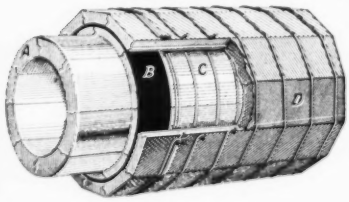
Robertshaw Mfg. Co.

Pittsburgh, Pa.

Wyckoff's Improved Steam Pipe Covering

MADE OF GULF CYPRESS—The Wood Eternal

This will give you an idea of its construction:



A—2 Inch Thick Inner Shell
B—Asphaltum Packing
C—Dead Air Space
D—1 Inch Thick Outer Shell

These points indicate that the highest standard of efficiency in steam pipe covering has been reached in this covering.

Gulf Cypress lumber—the wood eternal—is used instead of pine. The outer shell is one inch thick, the inner shell two inches and the dead air space ¼ inch, making the total thickness of the casing 3¼ inches. These features will more than double the life of the Wyckoff pipe covering. This pipe covering is absolutely the only one on the market with

Dead Air Space Between the Shells.

This dead air space between the shells has been increased 50 per cent over the former Wyckoff covering.

Send for our booklet today—it tells you all about these improvements.

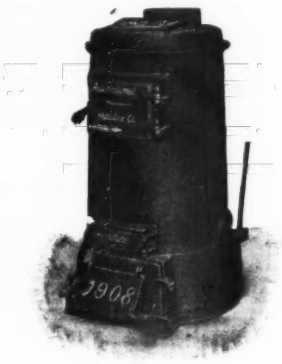
A. WYCKOFF & SON CO.

ELMIRA, N. Y.

Kindly quote "Domestic Engineering" in writing advertisers.

at the sign of good heating

INTERNATIONAL STEAM AND HOT-WATER BOILERS



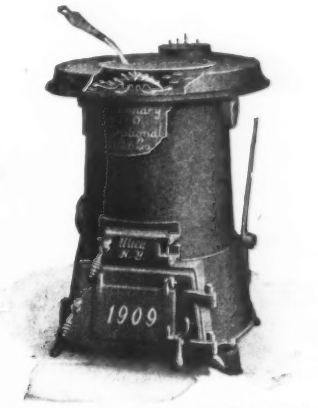
International Ihco Tank Heater

This ***International Tank Heater*** is made in eight sizes and will heat from 100 to 700 gallons of water per hour.

The larger sizes make very efficient hot water heaters for cottages, poultry houses, greenhouses, garages, etc.

Little, but Crammed full of Efficiency

This is the heater to use for the Domestic water supply and Laundry. Capacity 100 gallons of hot water per hour. Large flat top hot at all times. Readily accommodates irons, wash boiler or preserving kettle.



International Ihco Laundry Tank Heate

INTERNATIONAL HEATER CO.
Makers of Boilers **UTICA, NEW YORK**

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Distributors:
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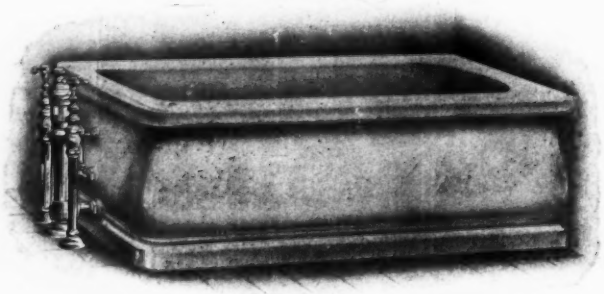
Solid Porcelain Bath Tubs



Wheeling Quality Solid Porcelain Bath Tub. Plate 14D.

This is one of the many attractive bath tubs shown in our complete catalog, which catalog, by the way, you should have.

We glaze these tubs OUTSIDE as well as INSIDE. Outside glazing so far surpasses painting that discriminating people readily pay the slight additional cost.

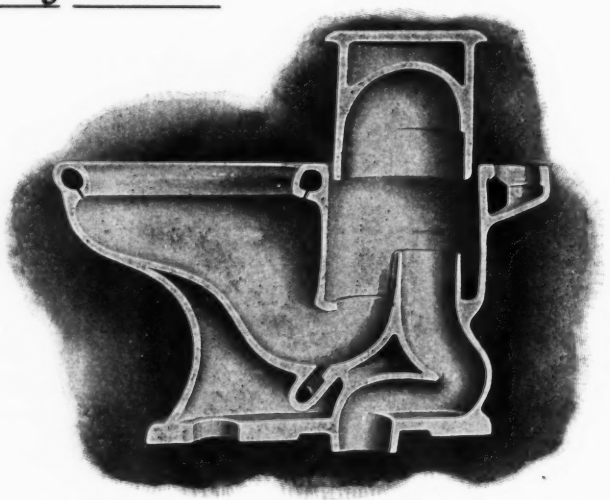
Seen the New Wheeling Cleanout?

To lift out section and remove an obstruction is the work of a moment. No tools needed; no plumber.

A masterpiece of simplicity and economy.

We also make all other kinds of closet bowls.

Write for Catalog D, just out; or consult the leading jobber in your locality.



Wheeling Cleanout Syphon Jet Closet; cross section showing cleanout coping partly lifted out.

The Wheeling Sanitary Manufacturing Company

General Offices - - - - Wheeling, W. Va.

If you wish to insure yourself and client against annoyance be sure the Range Boilers you purchase bear this label:

Electric Weld

NEW STYLE BOILER

THIS boiler is offered after three years' exhaustive experiment and test.

We recommend this type as superior to the riveted Seam Boiler or the "Electric-Weld" Boiler with riveted head and bottom.

By this process of construction, defects are practically eliminated.

This boiler will withstand all necessary handling in transit, and will give results not possible with a boiler made up with rivets.

John Wood Manufacturing Co.
CONSHOHOCKEN, PA.

The Engineering Directory

"The Trades' Standard Reference Book"
(Formerly Domestic Engineering Directory)

For 1912

Nineteenth Annual Edition

Adopted as Official by the American Supply and Machinery Manufacturers' Association.

Contains newly compiled and most authentic lists published, as follows:

1. Jobbers and Dealers in Mill, Steam, Mine, Heating and Lighting supplies, Tools and Machinery, in the United States.
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Classifies over 4,000 kinds of goods made by over 6,000 manufacturers, and over 50,000 trade or brand names of same.

Leather bound, about 1,400 pages, size 6⅞ x 3¾ inches.

Invaluable to Manufacturers, Dealers, Contractors and Salesmen.

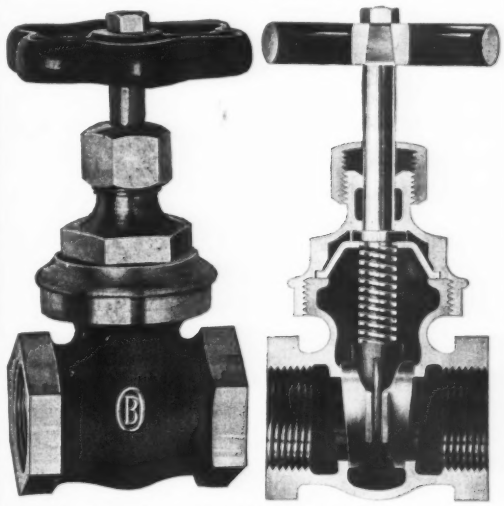
Published by The Crawford Publishing Co.

FOR SALE BY

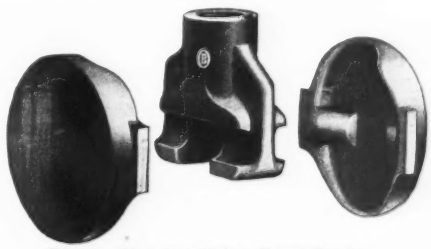
DOMESTIC ENGINEERING CO.
445-447 Plymouth Court, Chicago

Ohio Gate Valves

Get Them From Your Jobber



Result of the best scientific and practical experience in valve engineering. All unnecessary and complicated parts eliminated, combining simplicity and great strength. Ports give unrestricted passage to full capacity of pipe. An extra-high grade of packing is used.



Disc for Ohio Gate Valve—Patent Pending.

Disc is of flexible or built-up type, and compensates for any slight derangement of seat-angles due to pipe sagging, expansion or contraction of pipe lines. It is guided vertically by ribs cast in the body to insure perfect alignment with valve seats, and prevents finished faces of the disc from coming into contact with the unfinished parts of valve body. The clearance between valve gates and the bottom of body is great enough to prevent gates from becoming fouled against closing. Made in sizes from ¼" to 3".

Complete line of Radiator, Globe, Angle, Check, Lock-Shield and Gate Valves are listed in Catalog KD, mailed on request.

THE OHIO BRASS COMPANY
MANSFIELD, OHIO

WE have set up a standard of quality for our product and this is our sign. Whenever you see it on a tank or seat you have instant assurance of a quality in materials, in workmanship and in design unapproached by others. ¶ The work of art from time immemorial has been distinguished by the sign or mark of its creator.

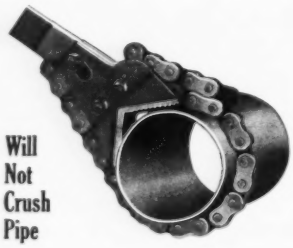
¶ A Quinn combination is a work of art and we are proud to stamp it with the emblem—

Send for our new S. catalogue.

Quinn Manufacturing Company

Dequindre & Division St., Detroit, Mich.

Instant Release Guaranteed



Will Not Crush Pipe

Positive Grip--no Bolt to Break

IT'S "THE GEALY"

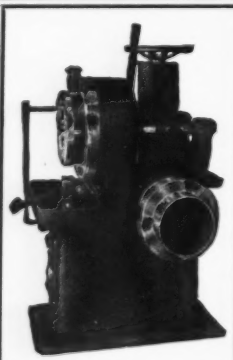
STUDY THE PRINCIPLE

Handle is cam-Lever—Jaws, cam-Thrust—Slot in Jaws allows Handle Bolt to move freely with action of Handle as cam-Lever. See it?

Write for circulars

THE GEALY WRENCH & MFG. CO.

Black Building, GROVE CITY, PA.



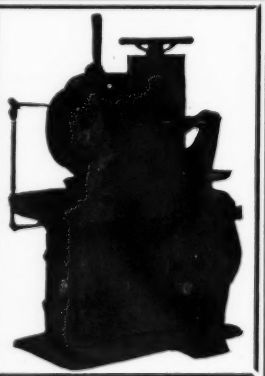
Loew Victor Pipe Machine

Belt Power, Motor and Gas Engine Driven, also Hand Operated —Sizes ¼ to 8 inches.

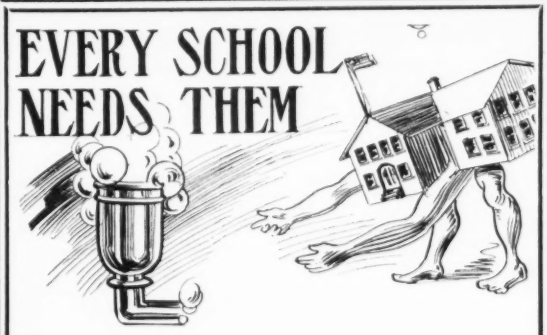
Acknowledged to be the most improved and substantially constructed machine of its type on the market.

The Loew Manufacturing Co.,

9000 Madison Ave., - - - Cleveland, Ohio

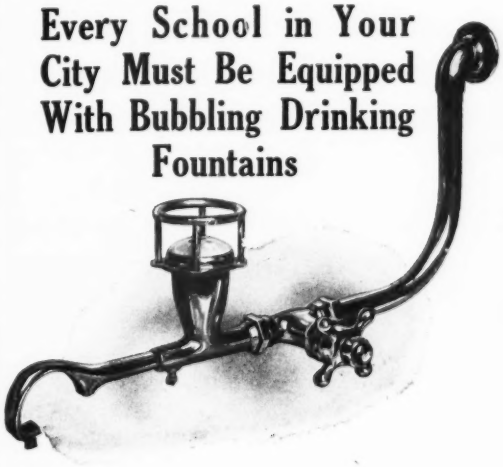


EVERY SCHOOL NEEDS THEM



IF you write for our catalog today and see the special lines that we have to offer you for installation in schools and other public buildings, you can reap immediate profit within a very short time.

Every School in Your City Must Be Equipped With Bubbling Drinking Fountains

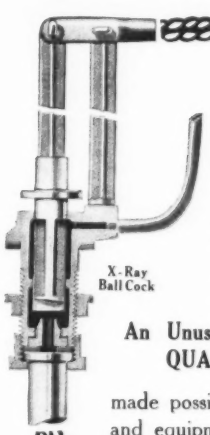


You can sell the bubbling drinking fountains and ours will give you the greatest selling advantage and profitable returns. The catalog will show you a type for every need and condition.

Get catalog and prices now.

M. H. Foundry & Mfg. Co.

BELLEVILLE, ILL.



X-Ray Ball Cock

EXCELSIOR COMBINATION

An Unusual Combination of Highest QUALITY and Lowest PRICE

made possible by our unequalled facilities and equipment, backed by years of successful experience in the business.

Our Closet Combinations are fitted with the X-Ray **Ball Cock**—a great favorite with the plumbing trade because of its many superior features. So simple it cannot get out of order. Not necessary for plumber to remove ball cock from tank, which usually causes a leak; has every advantage of an elevated ball cock with none of the disadvantages; makes less noise than any so-called noiseless ball cock.

Solid Bent Wood Tank, Handsome Saddle Seat, Bar Hinge.

Ask for particulars.

KNOTT MANUFACTURING CO.

FORT WAYNE, IND.

HARRY VERBEEK, 154 W. Randolph St.
Chicago Sales Representative

The Attractiveness of this Fig.

35-E Leader Water System

Is Quality Coupled with Price

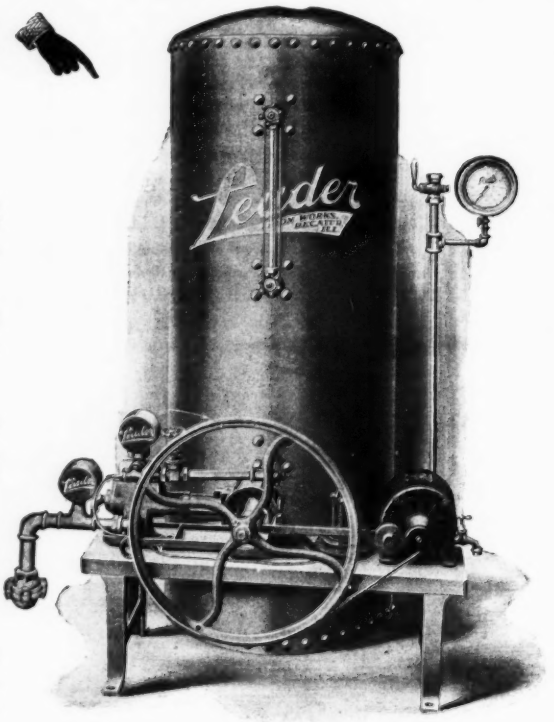
¶ For here's an electric driven outfit, Leader Fig 35-E, that just *fits in* to the conditions of hundreds of village, suburban and even city homes, and apartment buildings.

¶ It is not only simple, noiseless and absolutely automatic, but it can be sold at a *price* that is an *irresistible inducement* to the house-owner.

¶ The use of a round belt from motor to pump makes it possible to utilize a current-saving high speed motor that starts without jerk or friction—no worm gears or other power-consuming parts to eat up juice.

¶ As light running as a sewing machine, yet this combination of motor and pump produces a pressure of 50 pounds without hesitation or delay.

¶ The automatic controller cuts out the current to the motor when the pressure reaches 50 pounds, then cuts it in again when it drops to 30 with a precision that is more than human. Day after day this is repeated, without the intervention of the owner.



Leader Water System Fig. 35-E

¶ The working parts of the pump are encased in a dust-proof cover that prevents the splashing of oil about the floor and machine, and allows the parts to run continuously in an oil bath.

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(Entered as Second-Class Matter at the Postoffice at Chicago, Ill., under the Act of Congress of March 3, 1879)

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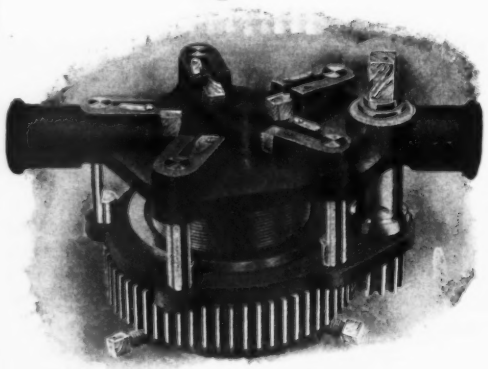

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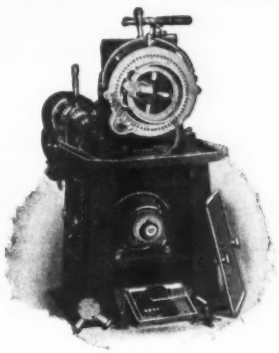

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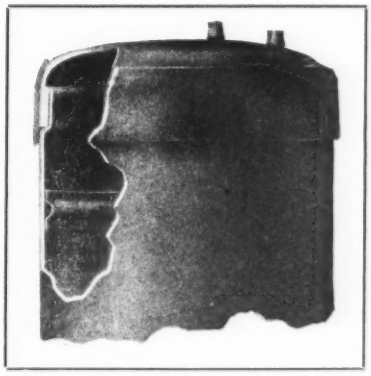

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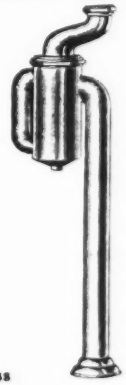

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Gages, Pressure-Indicating.
Marsh (Jas. P.) & Co.

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Marsh (Jas. P.) & Co.

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Marsh (Jas. P.) & Co.
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Gages, Water.
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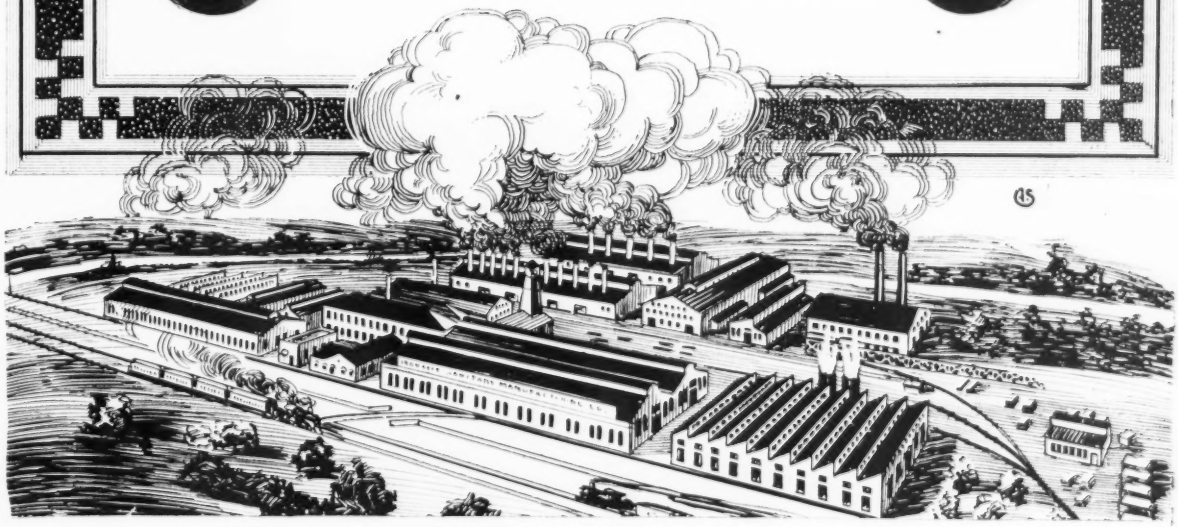
Pittsburgh, Pa.

U. S. A.



Kindly quote "Domestic Engineering" in writing advertisers.

"Domestic Engineering" Buyers' Directory—Continued

(See Page 66 for Addresses of Advertisers.)

Pipe-Conduits for Underground Steam Pipes.
American District Steam Co.
Johns-Manville Co. (H. W.)
Wyckoff (A.) & Sons Co.

Pipe-Hangers.
Illinois Malleable Iron Co.
Johnson & Hager.
Penn. Engineering Co.

Pipe-Locators, Wireless.
Modern Iron Works.

Pipe-Threading and Pipe-Cutting Machinery and All Necessary Supplies.
Armstrong Mfg. Co.
Bignall & Keeler Mfg. Co.
Borden Co.
Crown Die & Tool Co.
Curtis & Curtis Co.
Hart Mfg. Co.
Jarecki Mfg. Co.
Loew Mfg. Co.
Kemp (C. M.) Mfg. Co.
Nye Tool & Machine Works.
Saunders (D.) Sons, Inc.
Toledo Pipe-Threading Machine Co.
Trimont Mfg. Co.
Walworth Mfg. Co.

Pipe-Hooks and Straps.
Berger Bros. Co.
Johnson & Hager.

Pipe Straps (Galvanized).
Loew Mfg. Co.
Johnson & Hager.

Plugs, Test.
Blake Specialty Co.

Pumps, Force.
Deming Co.
Hartley Co. (C. J.)
Kellogg-Mackay Co.
Kewanee Water Supply Co.
Leader Iron Works.
Perkes (Chas.) Estate of.
Sanitary Pump Co.
Standard Pump & Engine Co.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Pumps, Vacuum.
American Steam Pump Co.
Automatic Vacuum Pump Co.
Deming Co.
Iroquois Engineering Co.
Jennison Co.
Monash-Younker Co.

Pyrometers.
(Marsh (Jas. P.) & Co.

Radiators.
Gurney Heater Mfg. Co.
Kellogg-Mackay Co.
Kewanee Boiler Co.
McCrum-Howell Co.
Shirley Radiator & Foundry Co.
U. S. Radiator Corporation.
Williamsport Radiator Co.

Radiator-Shields.
Monash-Younker Co.

Radiator-Trucks.
Stearns (F. M.) & Co.
U. S. Radiator Corporation.

Radiator Valves.
Frankfort Brass Mfg. Co.
U. S. Radiator Corporation.

Range-Boilers.
Badger (E. B.) & Sons Co.
Fleck Bros. Co.
Gerstein Bros. & Cooper.
Hayes Mfg. Co.
Scaife (Wm. B.) & Sons Co.
Simmons (John) Co.
Wolff (L.) Mfg. Co.
Wood (John) Mfg. Co.

Range-Boilers, Copper.
Badger (E. B.) & Sons Co.
Gerstein Bros. & Cooper.
Hayes Mfg. Co.

Ranges.
Illinois Malleable Iron Co.

Reamers, Pipe.
Keystone Die Stock Co.

Reducers, Eccentric.
Modern Iron Works.

Regulators, Hot Water.
Foster Engineering Co.
Honeywell Heating Specialty Co.
Mueller (H.) Mfg. Co.
Ross Valve Mfg. Co.
U. S. Radiator Corporation.

Regulators, Temperature.
Electric Heat Regulator Co.
Honeywell Heating Specialty Co.
Illinois Malleable Iron Co.

Retainers, Heat.
Ideal Heating Co.

Rubber Goods, Plumbing.
Canfield (H. O.) Co.
Central Brass Mfg. Co.
Kellogg-Mackay Co.
Mechanical Rubber Co.
Monarch Brass Co.
Wolff (L.) Mfg. Co.

Scale-Removing Compound.
Compound Injector & Specialty Co.

Seats and Covers, Water Closet (Vulcanized Rubber).
Walter & Co.

Seats, Water Closet.
Becker Mill Co.
Galard Co.
Johns-Manville Co. (H. W.)
Never-Split Seat Co.
Peerless Selling Co.
Plumbers' Woodwork Co.
Sanitary Mfg. Co.
Sanitary Seat Co.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Van Arnam Mfg. Co.
Wolff (L.) Mfg. Co.

Sewage-Disposal Systems.
Modern Iron Works.

Sewer-Rods.
Mueller (H.) Mfg. Co.

Sewer-Traps, Etc.
Barrett (James) Mfg. Co.
Blake Specialty Co.
Cudell, F. E.

Shields, Radiator.
Decatur Cornice & Roofing Co.
Johnson (W. H.) & Son Co.
Kellogg-Mackay Co.
Monash-Younker Co.
Wolff (L.) Mfg. Co.

Showers.
Imperial Brass Mfg. Co.

Shower Mixers.
Imperial Brass Mfg. Co.
Robertshaw Mfg. Co.

Sink Brackets.
Campbell Mfg. Co.
Jordan & Steele Mfg. Co.

Sink Frames.
Jordan & Steele Mfg. Co.

Sinks, Cast-Iron.
Blairsville Enameled Ware Co.
Cahill Iron Works.
Kellogg-Mackay Co.
Kohler (J. M.) Sons Co.
Standard Sanitary Mfg. Co.
Union Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Sinks, Copper.
Badger (E. B.) & Sons Co.
Wolff (L.) Mfg. Co.

Sinks, Earthenware.
Great Western Pottery Co.
Maddock's (Thos.) Sons Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Sinks, German Silver.
Badger (E. B.) & Sons Co.
Wolff (L.) Mfg. Co.

Sinks, Porcelain.
Graham (Chas.) Chem. Potteries Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Sinks, Porcelain Enameled.
Blairsville Enameled Ware Co.
Cahill Iron Works.
Iron City Sanitary Mfg. Co.
Kohler (J. M.) Sons Co.
McCrum-Howell Co.
Sanitary Mfg. Co.
Standard Sanitary Mfg. Co.
Union Sanitary Mfg. Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Sinks, Slate.
Wolff (L.) Mfg. Co.

Sinks, Slop.
Kellogg-Mackay Co.
Maddock's (Thos.) Sons Co.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Stands, Boiler.
Blake Specialty Co.

Stocks and Dies.
Armstrong Mfg. Co.
Borden Co.
Boston Brass Co.
Curtis & Curtis Co.
Hart Mfg. Co.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
Keystone Die Stock Co.
Loew Mfg. Co.
Nye Tool & Machine Works.
Saunders' (D.) Sons, Inc.
Toledo Pipe Threading Machine Co.
U. S. Radiator Corporation.

Stops, Self Closing.
Central Brass Mfg. Co.
Kellogg-Mackay Co.
Mueller (H.) Mfg. Co.
Standard Sanitary Mfg. Co.
Street & Kent Mfg. Co.
Wolff (L.) Mfg. Co.

Stoves and Ranges.
Humphrey Co.

Tanks and Floats.
Enameled Tank Co.

Tanks, Closet.
Central Closet Mfg. Co.
Scaife (Wm. B.) & Sons Co.

Tanks, Expansion.
Air-Tight Steel Tank Co.
Gurney Heater Mfg. Co.
International Heater Co.
Kellogg-Mackay Co.
Lord & Burnham Co.
Penn. Engineering Co.
Scaife (Wm. B.) & Sons Co.
U. S. Radiator Corporation.
Wilks (S.) Mfg. Co.
Wolff (L.) Mfg. Co.
Wood (John) Mfg. Co.

Tanks, Steel (Air-Tight).
Air-Tight Steel Tank Co.

Tanks, Hot-Water.
Consolidated Engineering Co.
Leader Iron Works.
Kewanee Boiler Co.
Scaife (Wm. B.) & Sons Co.
Wilks (S.) Mfg. Co.
Wood (John) Mfg. Co.

Tanks, Storage.
Air-Tight Steel Tank Co.
Berger Bros. Co.
Continental Radiator & Fdry. Co.
Gerstein Bros. & Cooper.
Kellogg-Mackay Co.
Kewanee Boiler Co.
Leader Iron Works.
Lord & Burnham Co.
Scaife (Wm. B.) & Sons Co.
U. S. Radiator Corporation.
Wilks (S.) Mfg. Co.
Wolff (L.) Mfg. Co.
Wood (John) Mfg. Co.

Tanks, Water Closet, Automatic Flush.
Kellogg-Mackay Co.
Maddock's (Thos.) Sons Co.
Sanitary Mfg. Co.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Wolff (L.) Mfg. Co.
Wood (John) Mfg. Co.

Tanks, Water Closet, Porcelain.
Maddock's (Thos.) Sons Co.
Peerless Selling Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Tanks, Water Closet, Porcelain Enameled.
Blairsville Enameled Ware Co.
Cahill Iron Works.
Enameled Tank Co.
Iron City Sanitary Mfg. Co.
Kohler (J. M.) Sons Co.
Sanitary Mfg. Co.
Standard Sanitary Mfg. Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Tanks, Water Closet, Seat Action.
Eljer Co.
Kellogg-Mackay Co.
Kohler (J. M.) Sons Co.
Peerless Selling Co.
Sanitary Mfg. Co.
Standard Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Tanks, Water Closet, Vitreous China.
Eljer Co.
Great Western Pottery Co.
Maddock's (Thos.) Sons Co.
Peerless Selling Co.
Sanitary Mfg. Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Tanks, Wood.
Galard Co.
Peerless Selling Co.
Standard Sanitary Mfg. Co.
Van Arnam Mfg. Co.
Wolff (L.) Mfg. Co.

Tapping Machines.
Mueller (H.) Mfg. Co.

Thermostats.
Andrews Boiler & Supply Co.
Jewell Mfg. Co.
Robertshaw Mfg. Co.
U. S. Radiator Corporation.

Thermometers.
Edelmann (E.) & Co.
Marsh (Jas. P.) & Co.
National Steam Specialty Co.

Tool Bags.
Excelsior Bag & Mfg. Co.

Tools, Plumbers' and Steamfitters'.
Anderson (W. H.) Tool & Supply Co.
Armstrong Mfg. Co.
Borden Co.
Hart Mfg. Co.
Kellogg-Mackay Co.
Mueller (H.) Mfg. Co.
Nye Tool & Machine Works.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Torches, Gasoline and Kerosene.
Globe Gaslight Co.

Towel Bars.
Galard Co.
Standard Sanitary Mfg. Co.

Traps, Back Water.
Barrett Mfg. Co.
Blake Specialty Co.
Cudell, F. E.
Illinois Malleable Iron Co.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Monarch Brass Co.
Weiler Bros.
Wolff (L.) Mfg. Co.

Traps, Brass.
Blake Specialty Co.
Central Brass Mfg. Co.
Compound Injector & Specialty Co.
Detroit Sanitary Supply Co.
Frost Mfg. Co.
Kellogg-Mackay Co.
Monarch Brass Co.
Standard Sanitary Mfg. Co.
Street & Kent Mfg. Co.
Wolff (L.) Mfg. Co.

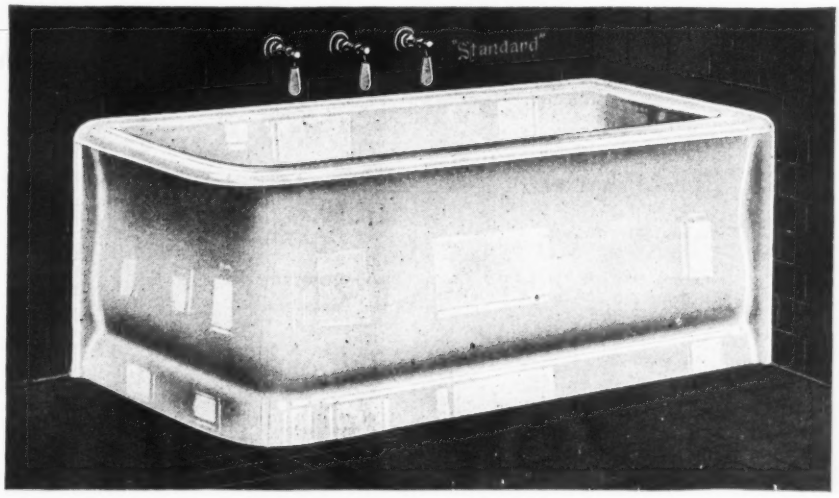
"Standard" "Glenroy" Bath

The "Standard" Porcelain Enameled "Glenroy" Bath for tiling in right-hand corner, with porcelain enameled front and end, represents the latest and most notable achievement in the manufacture of high-grade baths.

It possesses many desirable features, both as to utility and appearance. It is easily installed, highly sanitary and, on account of tiling into the wall, prevents the accumulation of dirt and moisture back of or under the bath.

The glossy white exterior of the "Glenroy" Bath not only adds greatly to the attractiveness of the bathroom but reduces cleaning labor to a minimum.

The "Standard" "Glenroy" Bath bears the "Standard" Green and Gold Guarantee Label and may be seen at any "Standard" showroom or store.



"Glenroy" Plate P 2207 K

"Standard" Porcelain Enameled "Glenroy" Pattern Bath, for tiling in right-hand corner, porcelain enameled front and end, with center outlet and 3½-inch roll rim; fitted with P 10055 "Imperial" bottom bell supply and waste fitting, ¾-inch supply pipes, Fuller valves, china lever handles with indexes and indexed china lever handle waste. This bath is designed for setting in marble or tile wainscoted walls.

Sizes	4½ feet	5 feet	5½ feet
Price, as described	$94.50	$99.50	$104.50

Standard Sanitary Mfg. Co.

General Offices, Pittsburgh, Pa.

OFFICES AND SHOWROOMS

New York.....35-37 W. 31st Street
Boston.....John Hancock Building
Chicago.....415 Ashland Block
St. Louis.....100-102 North Fourth Street
Philadelphia.....1128 Walnut Street
Washington, D. C..200 Southern Building
Pittsburgh.....106 Sixth Street
Cleveland.....648-652 Huron Road, S. E.
Toledo, Ohio.....311-13-15 Erie Street
Louisville.....319-323 West Main Street
Nashville.....315-317 Tenth Avenue, So.
Houston, Tex...Cor. Preston & Smith Sts.
Fort Worth, Tex..Front and Jones Streets
New Orleans..Cor. Baronne & St. Joseph Sts.
San Francisco, 1303-4 Metropolis Bank Bldg.
Toronto, Can.....59 Richmond Street, E.
Montreal, Can.....215 Coristine Building
London, Eng..57-60 Holborn Viaduct, C. E.

"Domestic Engineering" Buyers' Directory—Continued

(See Page 66 for Addresses of Advertisers.)

Traps, Catch Basins.

Compound Injector & Specialty Co.
Detroit Sanitary Supply Co.
Estabrook's (R.) Sons.
Illinois Malleable Iron Co.
Kellogg-Mackay Co.
Standard Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Traps, Grease.

Compound Injector & Specialty Co.
Estabrook's (R.) Sons.
Kellogg-Mackay Co.
Maddock's (Thos.) Sons Co.
Raymond Lead Co.
Standard Sanitary Mfg. Co.
Street & Kent Mfg. Co.
Wolff (L.) Mfg. Co.

Traps, Lead.

Blake Specialty Co.
Boston Brass Co.
Detroit Sanitary Supply Co.
Kellogg-Mackay Co.
Monarch Brass Co.
Raymond Lead Co.
Wolff (L.) Mfg. Co.

Traps, Radiator and Steam-Traps.

American District Steam Co.
Compound Injector & Specialty Co.
Consolidateed Engineering Co.
Dunham (C. A.) Co.
Kellogg-Mackay Co.
Marsh (Jas. P.) & Co.
Monash-Younker Co.
National Steam Specialty Co.

Traps, Refrigerator.

Central Brass Mfg. Co.

Traps, Return Steam.

Pratt & Cady Co.

Traps, Sink.

Blake Specialty Co.
Central Brass Mfg. Co.
Frost Mfg. Co.
Kellogg-Mackay Co.
Maddock's (Thos.) Sons Co.
Monarch Brass Co.
Monash-Younker Co.
Raymond Lead Co.
Standard Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Traps, Steam.

American District Steam Co.
Dunham Co., C. A.
Jenkins Bros.
Kellogg-Mackay Co.
Pratt & Cady Co.
Walworth Mfg. Co.

Unions, Brass.

Athol Pump Co.
Glauber Brass Mfg. Co.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
Mueller (H.) Mfg. Co.
Perkes (Chas.) Estate of.
Pittsburgh Brass Mfg. Co.
Street & Kent Mfg. Co.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Unions, Cast-Iron.

Athol Pump Co.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
U. S. Radiator Corporation.
Wolff (L.) Mfg. Co.

Urinals.

Cahill Iron Works.
Eljer Co.
Great Western Pottery Co.
Kellogg-Mackay Co.
Kohler (J. M.) Sons Co.
Maddock's (Thos.) Sons Co.
Peerless Selling Co.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Urinals, Cast-Iron.

Cahill Iron Works.
Kellogg-Mackay Co.
Kohler (J. M.) Sons Co.
Standard Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Urinals, Porcelain.

Great Western Pottery Co.
Maddock's (Thos.) Sons Co.
Peerless Selling Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Vacuum-Cleaning Machines.

McCrum-Howell Co.

Vacuum-Heating Systems.

Automatic Vacuum Pump Co.
Consolidated Engineering Co.
Dunham Co., C. A.
Iroquois Engineering Co.
Marsh (Jas. P.) & Co.
Monash-Younker Co.
Mouat Vapor Heating Co.
Vapor Heating Co.

Valves, Air.

Belknap Mfg. Co.
Consolidated Engineering Co.
Continental Radiator & Fdry Co.
Edelmann (E.) & Co.
Gurney Heater Mfg. Co.
Jarecki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Lord & Burnham Co.
Monash-Younker Co.
National Steam Specialty Co.
Penn. Engineering Co.
Perkes (Chas.) Estate of.
Wolff (L.) Mfg. Co.

Valves, Air (Automatic).

Marsh (Jas. P.) & Co.

Valves, Air (Relief).

Marsh (Jas. P.) & Co.

Valves, Back Water.

Compound Injectors & Specialty Co.

Valves, Brass and Iron.

Pratt & Cady Co.

Valves, Float.

Belknap Mfg. Co.
Kellogg-Mackay Co.
Monash-Younker Co.
Perkes (Chas.) Estate of.
Wolff (L.) Mfg. Co.

Valves, Gate.

Capitol Brass Works.
Central Brass Mfg. Co.
Detroit Brass Works.
Detroit Lubricator Co.
Jarecki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Ohio Brass Co.
Pratt & Cady Co.
Simmons (John) Co.
U. S. Radiator Corporation.
Wolff (L.) Mfg. Co.

Valves, Gate, Angle.

Detroit Brass Works.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
Lord & Burnham Co.
U. S. Radiator Corporation.
Wolff (L.) Mfg. Co.

Valves, Gate, Iron Body .

American District Steam Co.
Jarecki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Lord & Burnham Co.
Simmons (John) Co.
Wolff (L.) Mfg. Co.

Valves, Globe.

Central Brass Mfg. Co.
Detroit Brass Works.
Ohio Brass Co.

Valves, Globe, Iron Body.

Jarecki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Lord & Burnham Co.
Wolff (L.) Mfg. Co.

Valves, Pressure Regulating.

Consolidated Engineering Co.
Foster Engineering Co.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
Monash-Younker Co.
Mueller (H.) Mfg. Co.
Ohio Brass Co.
Ross Valve Mfg. Co.
Standard Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Valves, Radiator.

American District Steam Co.
Belknap Mfg. Co.
Capitol Brass Works.
Consolidated Engineering Co.
Davis (Louis N.) Co.
Detroit Brass Works.
Detroit Lubricator Co.
Gurney Heater Mfg. Co.
Honeywell Heating Specialty Co.
Jarecki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Kinsey & Mahler Co.
Lavigne Mfg. Co.
Lord & Burnham Co.
Monash-Younker Co.
Ohio Brass Co.
Penn Engineering Co.
Perkes (Chas.) Estate of.
U. S. Radiator Corporation.
Walworth Mfg. Co.
Wolff (L.) Mfg. Co.

Valves, Shower.

Robertshaw Mfg. Co.

Valves, Steam.

Belknap Mfg. Co.
Capitol Brass Works.
Central Brass Mfg. Co.
Detroit Brass Works.
Detroit Lubricator Co.
Gurney Heater Mfg. Co.
Jareki Mfg. Co.
Jenkins Bros.
Kellogg-Mackay Co.
Kennedy Valve Mfg. Co.
Kinsey & Mahler Co.
Lord & Burnham Co.
Monash-Younker Co.
Ohio Brass Co.
Perkes (Chas.) Estate of.
U. S. Radiator Corporation.
Wolff (L.) Mfg. Co.

Valves, Vacuum.

Consolidated Engineering Co.
Foster Engineering Co.
Imperial Valve Co.
Jarecki Mfg. Co.
Kellogg-Mackay Co.
Marsh (Jas. P.) & Co.
Monash-Younker Co.
Morgan-Clark System Co.
Perkes (Chas.) Estate of.
U. S. Radiator Corporation.
Walworth Mfg. Co.

Valves, Water-Closet, Flushing.

Becker Mill Co.
Boston Brass Co.
Haas (Philip) Co.
Kellogg-Mackay Co.
Sanitary Mfg. Co.
Van Arnam Mfg. Co.
Wolff (L.) Mfg. Co.

Valves, Water-Closet, Flushometer Type.

Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

Vent Caps.

Wolverine Brass Works.

Vises, Pipe.

Armstrong Mfg. Co.
Curtis & Curtis Co.
Jarecki Mfg. Co.
Nye Tool & Machine Works.
Parker (Chas.) Co.
Saunders' (D.) Sons, Inc.
Toledo Pipe Threading Machine Co.
U. S. Radiator Corporation.
Walworth Mfg. Co.

Vitreous-China Dressing Table.

Maddock's (Thos.) Sons. Co.

Vitreous-China Manicuring Table.

Maddock's (Thos.) Sons. Co.

Vitreous-China Sanitary Ware.

Eljer Co.
Great Western Pottery Co.
Maddock's (Thos.) Sons Co.
Peerless Selling Co.
Trenton Potteries Co.
Wheeling Sanitary Mfg. Co.

Washers, Leather, Paper, Asbestos, or Rubber.

Auburn Leather Goods Co.

Washing Machines, Water Power.

Bates (D. L.) & Bro. Co.

Wastes and Overflows.

A. D. Mfg. Co.
Central Brass Mfg. Co.
Detroit Sanitary Supply Co.
Kellogg-Mackay Co.
Mueller (H.) Mfg. Co.
Standard Sanitary Mfg. Co.
Street & Kent Mfg. Co.
Wolff (L.) Mfg. Co.
Wolverine Brass Works.

Waste-Pipe Couplings.

Stewart Mfg. Co.

Water Closet Bends.

Blake Specialty Co.
Rice (Edw. J.) Mfg. Co.
Southern Pipe & Foundry Co.

Water-Closet Brass Specialties.

Frost Mfg. Co.
Morency-Van Buren Mfg. Co.
Peerless Selling Co.

Water-Closet Combinations.

Becker Mill Co.
Eljer Co.
Fleck Bros. Co.
Galard Co.
Great Western Pottery Co.
Illinois Malleable Iron Co.
Kellogg-Mackay Co.
Kohler (J. M.) Sons Co.
Maddock's (Thos.) Sons. Co.
Peerless Selling Co.
Perkes (Chas.) Estate of.
Pfau Mfg. Co.
Pittsburg Brass Mfg. Co.
Sanitary Mfg. Co.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Van Arnam Mfg. Co.
Wheeling Sanitary Mfg. Co.
Wolff (L.) Mfg. Co.

IRON BODY TRAP SCREW FERRULES

We are furnishing some of the largest jobbers in the country—why not you? Don't forget that we guarantee to ship any order within one week.

King Manufacturing Company — Goods sold to jobbers only — BIRMINGHAM, ALABAMA P. O. BOX 481

They Went Wild Over 'Em

THE Plumbers from all over Michigan were in Kalamazoo a few days ago, had some sort of a convention or other and nearly every one of 'em was down to the factory and looked us over. The boss certainly threw himself.

He Handed Out 10c Cigars With Bands on 'Em

just as free and careless as though he was used to smokin' 'em every day himself. He certainly felt good and he had a right to, 'cause every Plumber we showed our "Kazoo" line of Tanks to said, "There's nothin' to it, Carl, you've got 'em beat a mile. The 'Kazoo Simplex' is the simplest, neatest lookin' and best all around Tank I ever saw, and then, too, the price is no higher than for a cheap wooden one."

The Plumber Knows His Business He is a Mechanic

and what he says in the Tank line goes. The Boss says he wishes every Plumber in the United States could visit us, 'cause then there wouldn't be only one kind of Tank used and that would be the "Kazoo Simplex." If you can't come and see us, the next best thing is to write me care

THE ENAMELED TANK CO., Kalamazoo, Mich.

"Domestic Engineering" Buyers' Directory—Continued

(See Page 55 for Addresses of Advertisers.)

Water-Closet Combinations, Automatic Flushing.

Central Closet Co.
Eljer Co.
Findelsen & Kropf Mfg. Co.
Haas (Philip) Co.
Kellogg-Mackay Co.
Kelly (Thos.) & Bro.
Maddock's (Thos.) Sons Co.
Perkes (Chas.) Estate of.
Standard Sanitary Mfg. Co.
Trenton Potteries Co.
Van Arman Mfg. Co.

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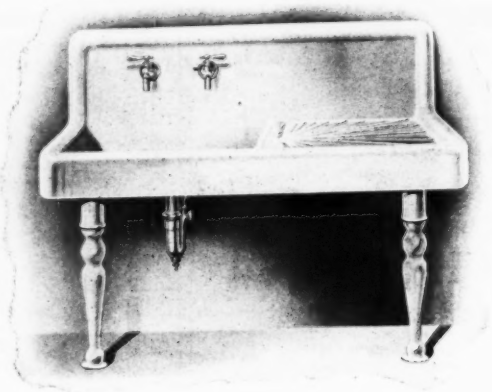

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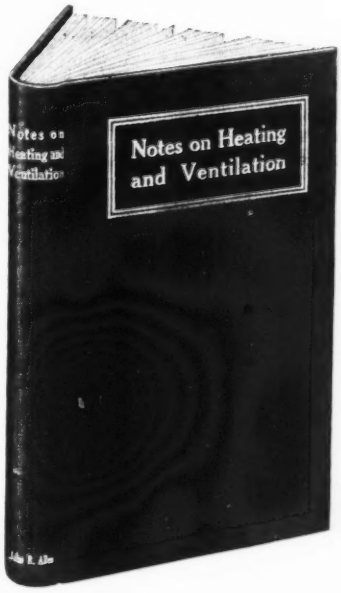

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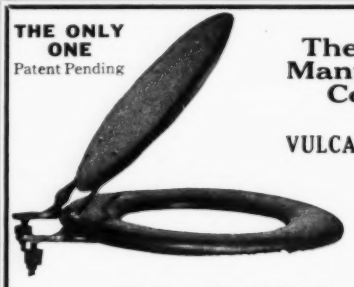

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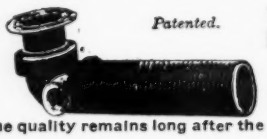

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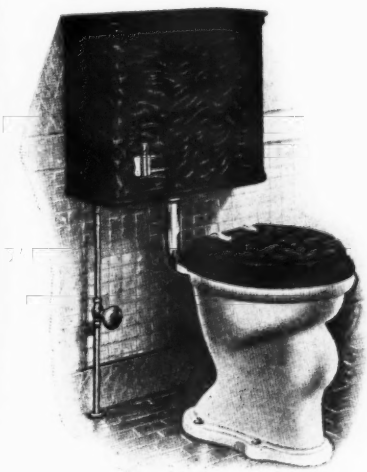

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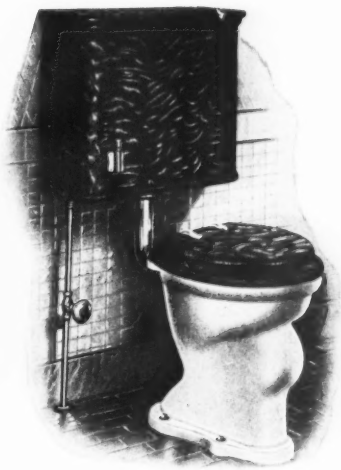

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Deal with us and you will know the reason.

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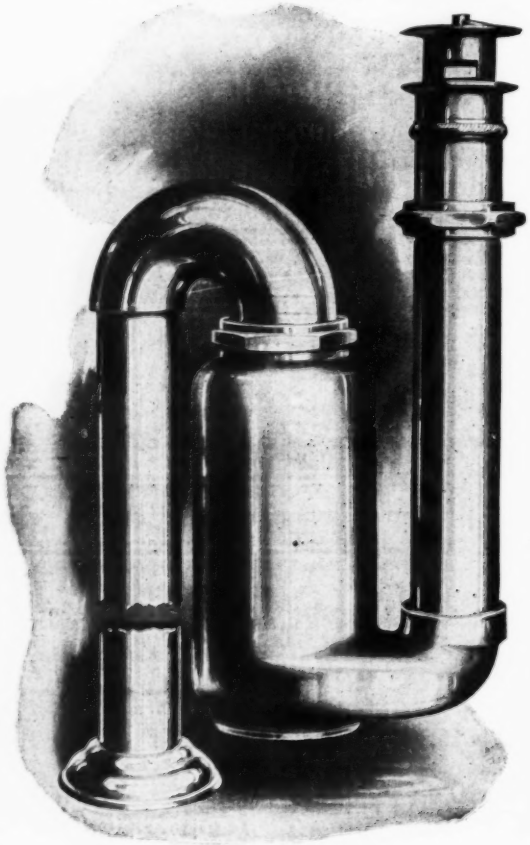

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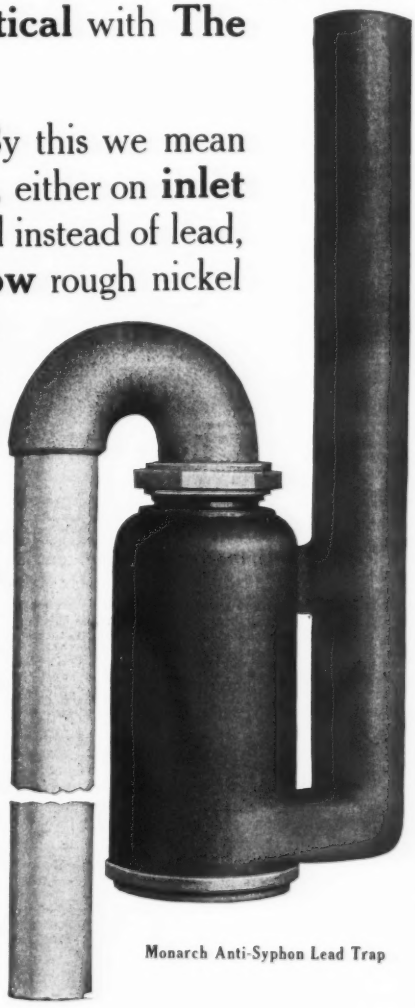

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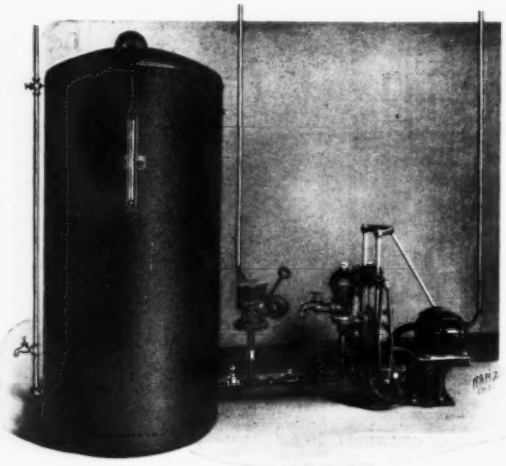

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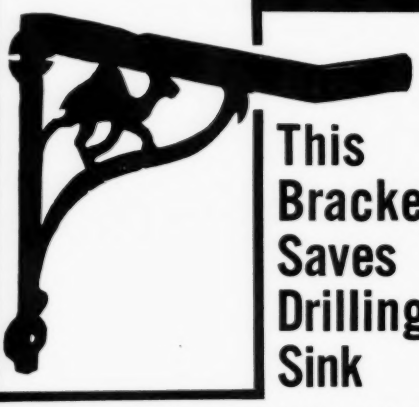

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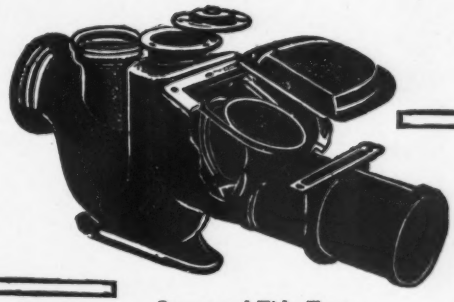

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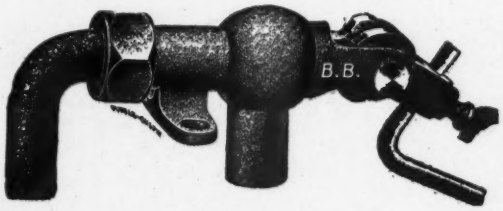

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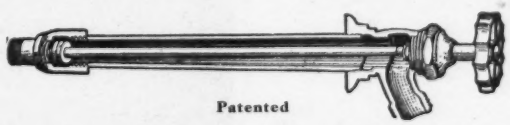

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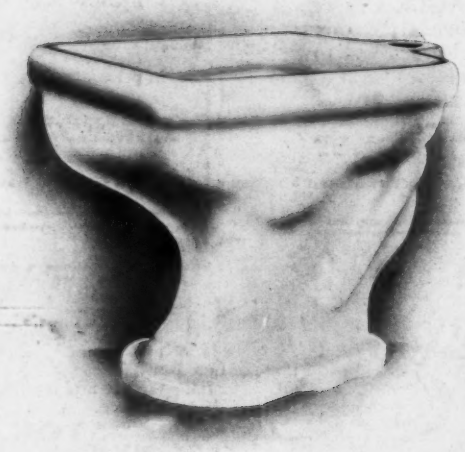

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